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No. XV., OF VOL. I., 1939. LONDON, SATURDAY, APRIL 15, 1939. Pp. 112—Price 1s.
No. 6033. VOL. CCXXXVI. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

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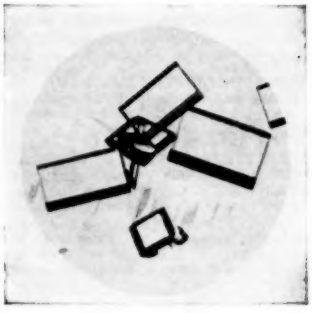

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ADDRESSES AND ORIGINAL ARTICLES

SURGICAL ANATOMY OF THE SUBTENTORIAL ANGLE

WITH SPECIAL REFERENCE TO THE ACOUSTIC AND TRIGEMINAL NERVES*

BY E. P. STIBBE, F.R.C.S.

PROFESSOR OF ANATOMY IN THE UNIVERSITY OF LONDON AT KING'S COLLEGE

THE work described below was carried out as part of an endeavour to answer three questions. Two of these concern the cochlear division of the eighth cranial nerve:

(1) Are the anatomical relations of the acoustic nerve such as to suggest the possibility of high blood-pressure and vascular disease affecting this nerve? In other words is there any local topographic explanation of the group of apparent† Menière's syndrome not associated with labyrinthitis—or of cases of severe tinnitus believed to be caused by high blood-pressure, with or without labyrinthitis?

(2) If the usual methods of treatment of tinnitus fail to cure the condition or to give great relief, is it a practical surgical proposition to divide the cochlear part of the eighth nerve?—provided, of course, that the surgeon feels that the case is sufficiently serious and obstinate to justify a formidable operation.

The third question concerns the trigeminal nerve:

(3) What light can be thrown anatomically, histologically, and experimentally on the comparative merits of the various methods of resecting portions of the fifth nerve in the treatment of idiopathic trigeminal neuralgia?

The study of these three problems is approached by the following methods:—

Anatomical.—(1) The anatomy of the subtentorial angle in which these nerves are found.

Experimental.—(2) Access for surgical purposes to the auditory nerve.

(3) Access (for the purpose of resection) to the fifth nerve.

(4) Experimental studies, in monkeys, of resections of different parts of the fifth nerve.

Anatomy of the Subtentorial Angle

For years I have been in the habit of teaching a region under the name of subtentorial angle, and I believe that other teachers use the same expression. The expression is not found in textbooks and does not appear to be an accepted name. Textbooks describe the posterior cranial fossa and the subtentorial region; cerebellopontine angle is a familiar anatomical term and cerebellopontine tumour a well-known clinical entity. The new expression subtentorial angle is introduced to carry the implication of the extreme narrowness of the special region to which the name is applied. Tumours, for example, in this space cause great pressure upon and deformation of the brain-stem; or a soft tumour in the space will sometimes be seen creeping out along the internal auditory meatus. Again, acoustic-nerve tumours ("acoustic neuroma") often compress and deform the trigeminal nerve; and—most striking evidence of a very constricted space—the relief of pressure induced by a decompression when the tumour is irremovable may lead to an almost immediate cessation of the fifth-nerve symptoms.

For these reasons, then, the term subtentorial angle is introduced. It is defined as that narrow space in the form of a triangular pyramid (fig. 2) situated under the lateral part of the anterior half of the tentorium cerebelli. The apex of the angle is directed medially and forwards and is the region where the cerebral peduncle leaves the pons and passes through the "door" of the tentorium. Here the pons is jammed rather tightly against the narrow anterior part of the overlying tentorium. Just below this lies the sixth cranial nerve piercing the dura mater on the basisphenoid (fig. 1). The base (surgically the inlet into the space) opens laterally and posteriorly across the sigmoid sinus into the

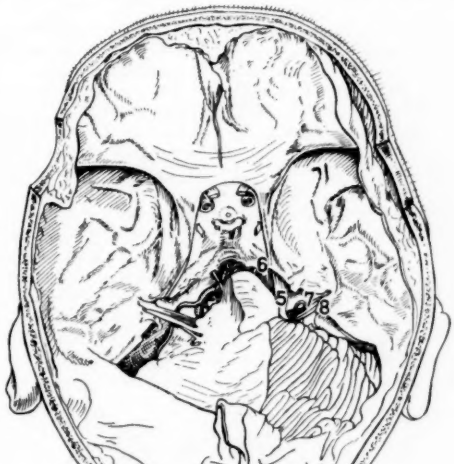

FIG. 1—General view of subtentorial space after removal of tentorium cerebelli. 5, trigeminal nerve; 6, abducent nerve; 7, facial nerve; 8, acoustic nerve in two divisions. Note anterior inferior cerebellar artery passing below nerves on left side and between them on right.

posterior part of the posterior cranial fossa. The walls (figs. 1 and 2) are: above and laterally the sloping and rather rigid and tight tentorium; below and laterally the sloping posterior surface of the petrous portion of the temporal bone; above and medially the lateral part of the inferior surface of the lateral lobe of the cerebellum and, further forwards, the side of the pons. The space is not wider than ½ in. at its widest part and is about 1 in. in depth.

Contents of the space.—This space is naturally a part of the subarachnoid space and as such contains cerebrospinal fluid in a fine network of trabeculæ stretching across from the arachnoid on the bone to the pia mater on the cerebellum and pons. (The arachnoid stretching across from the under surface of the pons to the adjacent part of the cerebellum forms a shallow cisterna to allow of the passage of the contents of the space. This is sufficiently definite to justify the application to it of a name; the name cisterna parafloccularis is suggested.) In this region,

* Based on a Hunterian lecture delivered before the Royal College of Surgeons on Jan. 27, 1936.

† These are described as "apparent" because Menière's syndrome is often referred to as though it meant only that group of the deafness-vertigos associated with definite labyrinthine suppuration.

as in other parts of the posterior fossa, the trabeculæ are exceedingly well marked and some of them coarse (fig. 3), a point of interest since, if our conceptions of the circulation of cerebrospinal fluid are correct, a considerable amount of the fluid will have to pass up through this network to reach the tentorial opening. Another place where the trabeculæ are particularly well marked is in the neighbourhood of the so-called cisterna magna near the middle line, where they stretch forwards so strongly that they form something like a septum. This is of interest in endeavouring to displace the cerebellum in posterior fossa operations and will be referred to later. Crossing this subarachnoid space are the fifth nerve and the seventh and eighth nerves and the nervus intermedius (fig. 1). The first group met with in approaching the region from behind is the composite of the eighth and seventh and nervus intermedius; the eighth, the first one to be seen in the posterior approach (fig. 2), is divisible anatomically, as well as functionally, into two parts—namely, the cochlear and vestibular. Of the group as a whole it is to be noted that it lies well in front of the most lateral projection of the cerebellum (fig. 1); so that one has to work forwards round the corner of the cerebellum; but up to this point the cerebellum, even in small monkeys, is easily retracted. The serious difficulties begin in working forwards beyond the eighth and seventh nerves to reach the fifth. The general direction of the nerves is notably upwards. The eighth is the most posterior, and the nervus intermedius comes off in intimate association with the eighth and runs independently between the eighth and seventh as far as the internal meatus, where it joins the seventh. This is the taste part of the nerve connected with the fasciculus solitarius; the secretomotor part of the nerve has its course not only in front of the eighth but at a much higher level. The cochlear division of the eighth nerve is separate from the vestibular at its origin and is the

FIG. 2—Subtentorial angle as seen from behind. More than half the lateral lobe of the cerebellum has been removed.

first part of the nerve to be seen in approaching it from behind.

Arteries.—The anterior inferior cerebellar artery is the principal vascular content of the space (figs. 1 and 3); it passes backwards generally under the fifth nerve and with a varying relationship to the seventh-eighth composite. Most frequently it passes under these—i.e., between these and the pons (fig. 1). Occasionally it passes over them; and not uncommonly it passes right through the nerves,

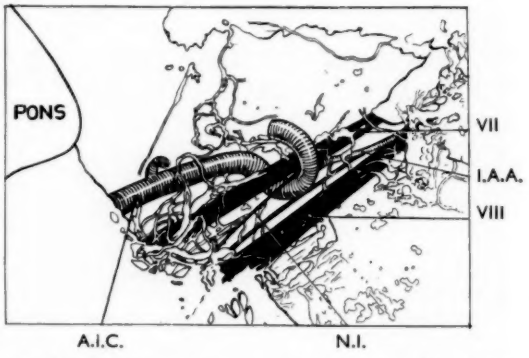

FIG. 3—The VII–VIII nerve-composite in the subtentorial angle. VII, facial nerve; VIII, acoustic nerve; N.I., nervus intermedius; A.I.C., anterior inferior cerebellar artery; I.A.A., internal auditory artery. Note the well-marked trabeculation of the subarachnoid space.

between the seventh and eighth, looping under the seventh and over the eighth (fig. 3) or sometimes over the seventh and under the eighth (fig. 4). In any case the artery is very tortuous, with a specially strong loop bringing it into immediate relationship with these nerves. At this part of its course it gives off, in most cases, the internal auditory artery, which holds it towards the meatus and therefore a little way out from the brain-stem and is the cause of the main loop, so that *the most proximal part of the nerves is relatively free from arteries* (fig. 3). In contrast with this, the distal part of the nerves is accompanied by the internal auditory artery. The posterior inferior cerebellar artery runs along the extreme lower part of the space, coming into intimate relationship with the most caudal nerves (ninth, tenth, and eleventh) and need not concern us in working on the eighth and fifth nerves.

Veins.—The upper part of the space is crossed by several small veins representing the superior cerebellar vein and the anterior inferior cerebellar vein. These run from the cerebellar margin across to the superior petrosal sinus. They are not constant, but commonly two veins may be expected to lie about the auditory nerve and one larger vein between this and the fifth nerve.

Surgery of the Auditory Nerve

The intracranial part of the auditory nerve described above is of surgical interest from three viewpoints:—

(*a*) The effects of acoustic tumour.

(*b*) The possibility of an explanation of certain cases of Menière's syndrome without gross labyrinthine disease, or of additional factors in its causation when labyrinthine suppuration is present.

(*c*) The question whether it is a practical proposition to divide the cochlear part of the eighth nerve in certain cases of tinnitus.

(*a*) *Acoustic tumour.*—It is only necessary to mention the early and general rise of intracranial pressure associated with the presence of this tumour right in the path of the cerebrospinal fluid, in an area already overcrowded and trabeculated. Similarly, the constricted nature of the area accounts for the production of hydrocephalus by the action of the above conditions and by marked compression and angulation of the pons and medulla (fig. 5). This deformity of the

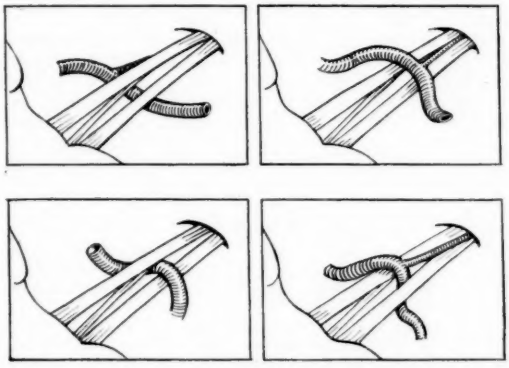

FIG. 4—Variations in the relationship of the anterior inferior cerebellar artery to the VII and VIII nerves (see text).

brain-stem is a striking feature of these tumours; indeed there is sometimes actual destruction of the brain-stem with loss of the projection paths.

The special interest of the acoustic tumour in the present connexion is its relation to the trigeminal nerve, which is commonly and early involved by forward extension of the mass. The order of appearance of the fifth-nerve symptoms throws light on the distribution of the fifth-nerve fibres. Significant of the tightness of the space is the fact that, when the tumour is deemed irremovable, the mere decompression operation leads to rapid relief of the fifth-nerve signs (as in a case I shall describe later).

(*b*) *Menière's syndrome.*—Cases of deafness and abrupt attacks of giddiness of epileptiform onset without labyrinthine disease are well known. It has been suggested that these may be due to increased blood-pressure (Maybaum 1918), or that, even with labyrinthitis, the underlying feature is increased blood-pressure (Wharry 1924). Wharry, working on clinical grounds only, reports a number of cases of severe tinnitus, some apparently "primary," others as sequelæ to labyrinthine disease. Many of these cases showed increased general blood-pressure, and the administration of trinitrin completely relieved the tinnitus—with relapse after the blood-pressure was allowed to rise again. Whatever may be the merits or otherwise of the pathological conception, it is a fact that the anatomical conditions are such that gross changes in the anterior inferior cerebellar artery might well irritate the eighth nerve—not only mechanically but also because this artery is the source of the blood-supply of the two nerves and of their ganglia. Stopford (1930) has shown that the internal auditory artery arises in most subjects from the anterior inferior cerebellar: I found this in 16 out of 26 cases; moreover, even if arising from the basilar artery, the internal auditory would be likely to be in the same pathological state as the other arteries of the region.

(*c*) *Surgical treatment of tinnitus.*—Although it seems that the eighth nerve was successfully resected as early as 1898 (Thomas) there are few descriptions of a proper set operation for this purpose. For example, Sachs and Alvis, writing as recently as 1921, say:

"Various methods have heretofore been used for cutting the eighth nerve intracranially. The favourite method has been to go through the mastoid process and pass a hook or knife in blindly, and sweep it around. Biehl (1900) and Thomas (1898) are the only ones who have applied an intracranial approach by retracting the lateral lobe of the cerebellum, and Van Gehuchten (1895) says he doubts if it can be done.

"As one of us had repeatedly exposed the eighth nerve by this route in human beings, and was opposed to operative measures carried out in the dark, this method was used. The operative difficulties are far greater, however (in dogs), than in human beings, on account of the peculiar distribution of blood-vessels. This accounts for our high mortality in this group of animals. The operative approach necessitates retracting the cerebellum slightly, and even the gentlest retraction causes degenerative changes as shown by the Marchi method."‡

Potts (1908) and Dench (1912) successfully divided the eighth nerve for the relief of severe tinnitus. Frazier (1913) gives a detailed account of a case in which immediate relief of intolerable tinnitus was obtained by section of the eighth nerve. In none of these cases does the attempt seem to have been made to segregate the cochlear fibres and divide these only. The point of the present paper is to endeavour to show that it is possible surgically to section the cochlear nerve without interfering with the vestibular. *Close to the pons* the cochlear division of the nerve-composite is separate from the vestibular, differs from it in texture (consisting of more closely packed and finer fibres), and can be individually dealt with. Moreover, in this position no blood-vessel of any magnitude is in danger. Nearer to the meatus the cochlear nerve disappears under cover of the vestibular and is inaccessible; here too the anterior inferior cerebellar and internal auditory arteries are in immediate relationship with the nerve. Close to the pons in the cadaver and in the living monkey, a hook can be introduced between the two nerves, and that part which lies nearest the operator—namely, the cochlear—can be cut or torn across.

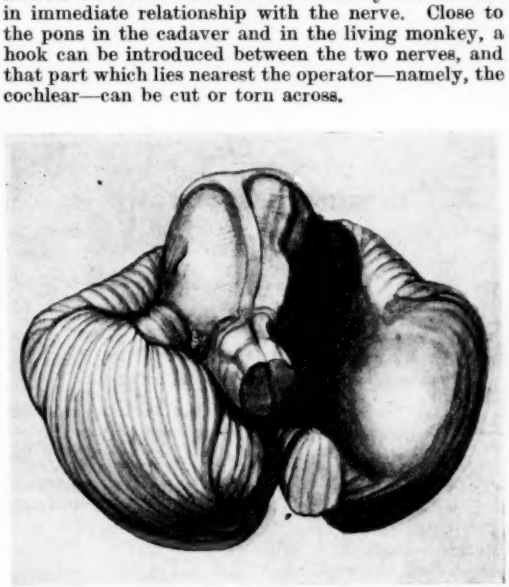

FIG. 5—Deformity of pons and medulla produced by a large acoustic tumour. Note displacement of trigeminal nerve.

Note on the operative procedure in monkeys.—The animals used were well-developed specimens of *Macacus rhesus*. They were kept in the department for a week or more before operation—a procedure to

‡ I found that in practising Dandy's (1929) posterior-fossa approach to the fifth nerve in monkeys, the retraction of the cerebellum caused such torsion of the mid-brain as to give very extensive areas of degeneration and thus spoil any attempt to trace ascending degeneration.

be recommended with such animals for any experimental purposes—so that they get at least relatively tame, accustomed to the laboratory assistants, and willing to eat.

The anæsthetic used is either Dial (fluid) 1·5–2·0 c.cm. or Nembutal 3–5 grains. No effort was made to establish a weight-dosage ratio; but no disasters were met with either as overdosage or untimely recovery. Anæsthesia was induced with a mixture of chloroform and ether (C.E.) and the injection then given intraperitoneally. Nembutal acts so quickly that the C.E. can be stopped as soon as the injection has been given; dial requires about ten minutes.

The operation is the orthodox opening of the posterior fossa as in man: only one side need be opened to give sufficient access; but this is not meant as a comment on the bilateral procedure in man, for the torsion of the brain-stem induced by the pushing aside of the cerebellum would be materially lessened by opening the posterior fossa on both sides.

The bone is perforated with a heavy brace and burr—in my experience much the most satisfactory way of entering the skull in human as in animal surgery; it is rapid and, *provided no pressure is used*, under perfect control. In enlarging the opening respect is paid to the transverse sinus above and the region of the mastoid emissary vein laterally. The retraction of the cerebellum is made easier by working along the subdural space towards the middle line in the first place, to open up the cisterna magna. This is also pointed out by Frazier and by Dandy; it may be that one breaks down some trabeculæ or merely that the space is sealed laterally by the close approximation of the cerebellum to the dura; in any case the result of the manipulation is a gush of cerebrospinal fluid and appreciable easing of the movement of the cerebellum. Once the dura is entered, there need be no significant bleeding. A very strong focusing headlight is essential. With regard to hæmorrhage, I have been strongly impressed with the method introduced to me by Prof. Hugh Cairns, of using fragments of muscle as a styptic packing.

(*To be concluded*)

CUSHING'S SYNDROME

REPORT OF A CASE IN WHICH NO ENDOCRINE TUMOUR WAS FOUND

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IN 1932 Cushing drew attention to a syndrome with which his name is now associated. Though he entitled his paper Basophil Adenomas of the Pituitary Body and called the condition pituitary basophilism, the wording of his report is more cautious. The subsequent publication of cases presenting a picture almost identical with that which he described but in which there was no basophil tumour has more than justified this caution, and work such as that of Costello (1936), who found that adenomata were present in 22·5 per cent. of 1000 hypophyses chosen at random, and that of these 27·2 per cent. were basophilic and in every instance had produced no symptoms, seems to render the term pituitary basophilism meaningless. Cushing's syndrome at present, then, seems to represent a clinical end-picture and no more; hence in our present state of knowledge it appears to be a mistake to describe, as has been recently done, a case of adenoma of the adrenal cortex as "simulating" Cushing's syndrome, since the identity of any case with the syndrome must depend on its degree of simulation.

The following case is possibly worth placing on record, for the clinical picture down almost to the smallest detail was that described by Cushing, yet at autopsy no definite evidence of glandular disorder could be detected by the usual methods.

CLINICAL RECORD

The patient was admitted to the Royal Victoria Infirmary, Newcastle-on-Tyne, on Aug. 18, 1935. He was then 26 and had begun to put on weight rapidly from the age of 21.

Two years before admission he had noticed gross striations over his abdomen and arm-pits. A year previously he had developed a series of boils down one flank, for which until the time of admission he had been attending the skin department. During this time he began to have severe pains in the forehead. These pains came on shortly after meals and lasted for about a quarter of an hour, during which he often had difficulty in seeing, saying that "bright lights came like sparklets." His nose had often bled, he had become very short of breath and thirsty, drinking as much as a jug of water a night, and his face had become so plethoric that he was referred to us as a case of polycythæmia.

At the time of admission he was, as the figure shows, a rather short man and obese, particularly in his abdomen, thorax, and face, his arms and legs being normal. His complexion was florid, and there was an unusual amount of hair over his chest, abdomen, and back, which had, he said, much increased during the past year. He perspired very freely and his sweat had an acrid smell, which was very noticeable about his bed; he was also exceptionally nervous, and, despite his obesity, there was a mild degree of exophthalmos. Exceedingly gross bright purplish striations were present (see figure); the many scars that his boils had left were of a somewhat duskier purple.

When he first came up to see us he had complained of precordial pain and particularly that his feet became swollen towards the end of the day; neither this pain nor this swelling occurred during his stay in hospital, when he was confined to bed. He appeared to suffer more from headaches, from his eyes, and from hot "burning sensations" in the face.

When he was admitted to the ward he had a slight discharge from a sinus in the sacrococcygeal region, which appeared to be relatively shallow and to be the sequela of a boil. At this time he had a blood-count of 6,000,000 red cells and 25,000 white cells per c.mm., with a hæmoglobin percentage of 100. His blood-urea was 26 mg. per 100 c.cm., and his standard urea-clearance was 98 per cent. of normal; subsequently, on Oct. 14 this fell to 57 per cent. of normal. His blood-calcium was 10·6 mg. per 100 c.cm. of serum and inorganic phosphorus 1·64 mg. per 100 c.cm. of plasma. Radiography revealed very definite rarefaction of the long bones.

He had nocturnal frequency of micturition, his urinary output was 80–100 oz. a day, and he drank large quantities of water. At times a trace of sugar was noticed in his urine, and towards the end of his stay this increased, and a definite attempt was made to control it with insulin, though without much success. A sugar curve done at the time of admission showed a significant rise in his sugar tolerance:—

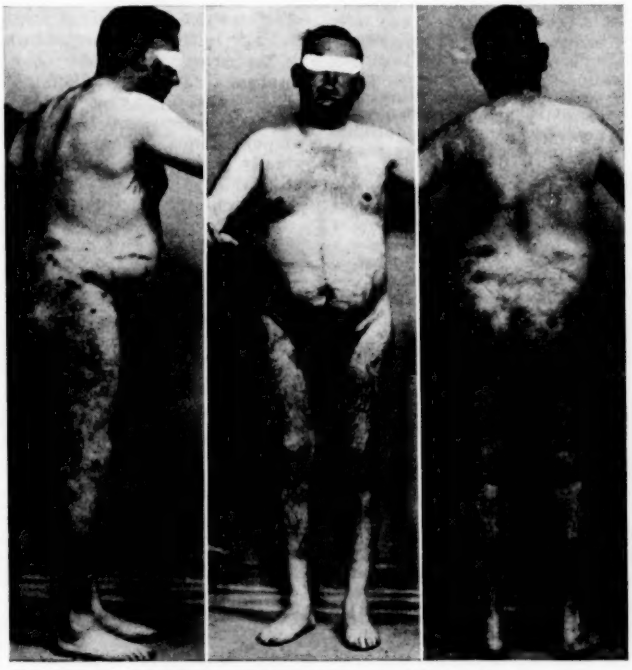
	Blood-sugar (mg. per 100 c.cm.)	Urine-sugar
Before dextrose	0·120	0
½ hr. after dextrose	0·212	0
1 hr. "	0·248	Trace
1½ hr. "	0·300	Trace
2 hr. "	0·231	+

Another sugar curve was done on Oct. 14, when sugar was now present in most of his specimens of urine:—

	Blood-sugar (mg. per 100 c.cm.)	Urine-sugar
Before dextrose	0·199	Trace
½ hr. after dextrose	0·278	+
1 hr. „	0·316	++
1½ hr. „	0·345	++
2 hr. „	0·335	+++

On clinical examination little abnormal was found in his heart and lungs, but his blood-pressure, which throughout remained about 150/120, was raised. Apart from the superficial skin lesions mentioned his abdomen was normal, his testicles were of normal size, but his penis was rather small.

His intelligence seemed to be slightly impaired, he complained that he could not take an interest in things, and in particular it was found hard to get him to concentrate. Clinically it was thought that there was some definite impairment of his left temporal field of vision, and there appeared to be some slight swelling of the optic disk on this side, but the ophthalmologist called in was unable to confirm this, his report being as follows: "Impossible to plot out fields in this case. He has no idea of coöperating. Fundi: doubtful blurring of left disk, inferior vein engorged and margins blurred, and physiological cup looks as if it is becoming filled in. Right disk probably normal—blurring above and below probably due to early division of vessels."



Physical appearance of a man, aged 26, with Cushing's syndrome, showing obesity and striations.

There were no other gross clinical findings in his central nervous system, but a radiogram of his pituitary fossa revealed "rarefaction of the posterior clinoid processes—floor of sella is ill defined—very suspicious of local lesion," and it was felt that in the circumstances a course of deep X-ray application to the pituitary region was justified. The Aschheim-Zondek test was negative.

On Oct. 11, after this course of therapy, the patient said that he felt much better; his boils had, however, become troublesome again, and the sinus in his back was discharging more freely. Before exploring this, an attempt was made with insulin to lower his blood-sugar so as to bring about natural recovery; slow improvement was made.

On Nov. 4 a large crop of warts, which had appeared under his prepuce and between his buttocks, were excised, but his back, owing to his general condition, was not explored. Shortly after operation he died.

AUTOPSY FINDINGS

The body was that of a man 5 ft. 3 in. in height, weighing 10 st. 13 oz., and of moderate physique and nutrition. There was a small incised abscess in the right leg, and in the upper part of the left buttock there was a gangrenous cellulitis from skin infection. The *fat* was definitely excessive in the abdominal and thoracic walls, the mediastinum and epicardium, and to a less degree the mesentery. The *thymus* was almost completely replaced by fat.

The *heart* was a little enlarged transversely and weighed 15·5 oz. Its vertical, transverse, and antero-posterior diameters measured 9·5 cm., 12 cm., and 6 cm. respectively. The right ventricle was a little dilated, with accompanying fatty infiltration of its wall. The left ventricle was a little dilated and hypertrophied. The heart muscle showed acute toxic change. There were no gross pathological changes in the valves, pulmonary artery, thoracic aorta, and coronary arteries. The left lower lobe of the *lungs* was collapsed and covered by old thickened pleura, and on section there was a slight degree of bronchiectasis. The right lung showed no special feature.

The *spleen* weighed 5·75 oz.; externally and on section there was no special feature. The *liver* was enlarged and weighed 88 oz.; on section considerable fatty infiltration was seen. The *gall-bladder* was healthy. The right *kidney* weighed 6 oz. and the left 5¼ oz.; section showed toxic and fatty change but no gross evidence of nephritis or pyelitis. The *supra-renals* were enlarged, very soft, and friable; the left weighed 14·57 g. and the right 11·2 g. The cortex was uniform in amount and pale, the medulla being cavitated; there were no obvious adenomata. The bladder, prostate, seminal vesicles, testes, stomach, duodenum, intestines, and pancreas showed no evidence of disease.

The *skull* was cut very easily with the saw, and pinkish-red diploë occupied the bulk of its thickness. The *brain* weighed 44 oz.; there was no meningitis, and the vessels were healthy. Section showed terminal venous congestion and œdema but no evidence of disease. The *pituitary gland* measured 1·2 cm. long, 1·35 cm. across, and 0·8 cm. vertically. There was no abnormality of the infundibulum. The diaphragma sellæ was thickened, dull, opaque, and adherent to the upper surface of the gland, which was difficult to remove. The sella turcica was a little eroded and softened and dull red. The gland was firm and its anterior lobe a little enlarged. Section revealed a small oval cyst in the pars intermedia, and in the anterior lobe was a small oval area darker than the surrounding glandular tissue.

The immediate *cause of death* was held to be toxæmia from gangrenous cellulitis of the left buttock.

HISTOLOGY

The *heart muscle* showed cloudy swelling, and the *liver* much fatty infiltration. In the *kidneys* there was

cloudy swelling in the epithelium of the convoluted tubules but no evidence of nephritis. In the *spleen* there were some reticulo-endothelial hyperplasia and a moderate quantity of blood pigment both in macrophages and lying free. The *prostate* showed considerable catarrhal desquamative changes in the ducts and acini. There were no pathological features in the *testicles* and *pancreas*. The *suprarenals* showed cloudy swelling and a poor lipoid content; there was no cortical adenoma and no hyperplasia of the zona fasciculata. The vault of the *skull* showed considerable osteoporosis; the diploë was in excess, occupying the bulk of the thickness of the bone.

The *pituitary gland* was bisected sagittally, and serial sections of the right and left halves were cut and stained with hæmatoxylin and eosin. The anterior lobe (pars distalis) was very vascular, and the only prominent feature was in connexion with the blood-vessels. Running through the middle of the lobe were irregular collagenous septa, which in parts merged into a dense fibrous knot containing numerous, widely dilated, venous capillary spaces representing a slightly exaggerated degree of the normal sinusoidal structure. Closely adjacent to this structure was a very small collection of basophil cells which did not constitute a basophil adenoma. In the pars intermedia were several tubular spaces lined by flattened epithelium and containing colloid material. One of these spaces was distended into a large cyst which could be seen by the naked eye. At the posterior border of a large colloid-containing space in the pars intermedia there was a small collection of acidophil cells, roughly the size of a high-power field, encroaching upon the pars nervosa.

There was no distinct basophil adenoma of the pars distalis of the pituitary gland and no cortical adenoma of the suprarenals. A section of the pituitary was sent to Dr. A. C. Crooke, who reported that hyaline cells of the type he has described were present.

DISCUSSION

In this case the clinical picture in its completeness contrasted remarkably with the negative post-mortem findings. This emphasises what seems at present the most significant feature of Cushing's syndrome—namely, the fidelity with which its complex clinical picture is reproduced by apparently diverse causes. The syndrome has been associated with both basophil (Bland and Goldstein 1937) and chromophobe (Fuller and Russell 1936) tumours of the pituitary, with tumours of the suprarenal cortex (Lescher and Robb-Smith 1935) and of the thymus (Leyton et al. 1931), and, as in this case, with no demonstrable tumour (Maclay et al. 1938).

Now, as Costello (1936) has pointed out, "probably there can be no absolute criterion by which one can differentiate true adenoma formation and unusual structural variations"; clear-cut distinctions are difficult and may ultimately prove to have been in the main of academic interest. In our case the anterior lobe was slightly enlarged, but the dimensions of the pituitary were otherwise normal. Such small accumulations of basophil cells as were detected on serial section were not thought by us sufficient to constitute either an adenoma or subclinical adenoma, nor did we consider there to be evidence of increased basophil infiltration. It is therefore interesting to note that Crooke's (1935) hyaline change was present. This change has been present in almost every case of this syndrome so far examined; but recently it has also been described in other conditions. Rasmussen (quoted by Dunn 1938) states that the clearest example of this change that he has observed was in a case of arrhenoblastoma of the ovary. Crooke (1938) has noted a similar change in pituitary remnants in incompletely hypophysectomised rats; he regards these changes as analogous and as representing secretory over-activity. It is therefore becoming increasingly unlikely that these changes are primary. As Dunn (1938) points out, "As the basophil cells are the alleged source of the gonadotropic fraction, a paradox is created when a primary physiological cellular hyperfunction is reputed, yet clinical evidence and gonadal pathology exhibit a hypofunctional state." This paradox can readily be resolved on the assumption that the pituitary hyperfunction, as in Crooke's incompletely hypophysectomised rats, is but an expression of a demand incompletely met, and that in this condition the hyaline changes are no more primary than the somewhat analogous changes noted in the pituitary after castration or during pregnancy. The increased liability to this condition shown by women, a liability in our experience greater than that revealed by the published cases, is perhaps not without significance.

The accompanying table shows that certain endocrine disorders have a very definite female preponderance, whereas others in which the same gland is involved show just as remarkable an impartiality. It is apparent that while the latter group, such as acromegaly and diabetes mellitus,

SEX-INCIDENCE OF SOME ENDOCRINE DISORDERS

Disorder	Total	Female	Male	Reference
"Basophilism"	42	32	10	Bland and Goldstein (1937)
Acromegaly	1,243	49%	51%	Atkinson (1932)
Simmonds's disease	65	47	18	Calder (1932)
Graves's disease	127	120	7	Campbell (1921)
Myxœdema	109	94	15	Clinical Society of London (1881)
Addison's disease	566	35%	65%	Guttman (1930)
Adrenogenital syndrome	24	19	5	Grollman (1936)
Diabetes mellitus	15,000	57·4%	42·6%	Joslin et al. (1937)

are associated with fundamental growth processes common to both, Graves's disease and the adrenogenital syndrome appear to be more closely linked with the endocrine balance of sex. This suggests that the preponderance of these conditions in the female may be an expression of the increased complexity of the cyclical changes in woman associated with menstruation and pregnancy. If this view be accepted, it follows that the endocrine disorders most likely to have this preponderance are those which on analysis are found to represent some aberrant stage in this cycle. This likelihood is much increased when, as in the condition under discussion, more than one glandular disturbance can apparently produce the same end-result. This and allied conditions therefore seem to us of interest when viewed as particular examples of the general theory of disease advanced by Allbutt (1896) in the first edition of his "System of Medicine." If, as he suggests, "disease is a state of a living organism, a balance of function more unstable than that which we call health; its causes may be imported, or the system may 'rock' from some implicit defect, but the disease itself is a perturbation which contains no elements essentially different from those of health, but elements presented in a different and less useful order," then, for several different factors to be capable of producing, as here, a similar end-state argues the relative stability and biological significance of this particular end-state. It may therefore be no mere

coincidence that Cushing's syndrome presents so many features often associated with pregnancy. Amenorrhœa and loss of libido are the rule in these cases; the Aschheim-Zondek test is occasionally positive; in both the sugar tolerance is diminished, and there is a moderate degree of cholesterolæmia; in both hirsutism and obesity may occur, and the peculiar striations of the skin, which may be such a feature of both conditions, seem to represent more than simply an expression of increased tension. The resemblance is by no means complete, nor, with the principal actor absent in one, could it be; it may be entirely superficial and of no significance, yet it serves to call attention to certain fundamental features of rather a remarkable condition, the nature of which is at present altogether obscure.

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Rasmussen, quoted by Dunn (1938).

A CASE OF POLIOMYELITIS
WITH BILATERAL PARALYSIS OF MASTICATORY MUSCLES

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(From the Hospital of the Brothers of St. John of God at Prague)

A FEW years ago we published a case of poliomyelitis with unilateral paralysis of the masticatory muscles that had been treated in our hospital (Sittig and Krátký 1936). We now describe a case of poliomyelitis with bilateral paralysis of the muscles of mastication.

CASE-RECORD

A male student, aged 15, was admitted to our hospital on Aug. 6, 1938. At 11 he had had an operation for fractured right elbow. He fell ill on Aug. 4 while on holiday in the country. He had headaches, his temperature rose to 104° F., and he vomited, had no appetite, and was listless. On Aug. 6 he had herpes labialis and vertigo.

On admission his temperature was 104·4° F., pulse-rate 102, and blood-pressure 115/80. The pharynx and the tonsils were reddened. The heart and lungs were normal. The abdomen was soft and not tender to pressure. The liver and spleen were not enlarged or palpable. There was rigidity of the neck. There was a trace of albumin in the urine.

On Aug. 7 a lumbar puncture was performed. The cerebrospinal fluid contained numerous lymphocytes but no meningococci.

On the 9th he was neurologically examined. His pulse-rate was 68. The pupils were equal and reacted to light. The fundi were normal. The rectus externus muscle of the left eye was weak and there was nystagmus, especially on the left side. The patient kept his left eye closed and complained of photophobia. All the muscles supplied by the right facial nerve were weaker than those of the left. The tongue was protruded straight. Sensibility of the face was unimpaired. The patient could not close his teeth or open his mouth widely. He could not raise his right arm at the shoulder-joint or sit up by himself. In the sitting position the head was inclined to the left, and the patient could not bend his head forwards. Otherwise movements were unimpaired, especially those of the lower limbs and abdominal wall. The reflexes of the upper limbs were present on the left side but absent on the right side except the triceps reflex. The thumb sign (Mayer) and the palm-chin reflex (Marinesco and Radovici) were present on both sides. The knee-jerks, ankle-jerks, and abdominal reflexes were present on both sides. There were no pyramidal signs. Sensibility was unimpaired. The neck and the whole spine were tender to pressure, the neck being slightly rigid. Lasègue's sign was positive on both sides. Speech was somewhat nasal and indistinct.

Another lumbar puncture was performed and the cerebrospinal fluid examined thoroughly (Dr. Fantl). The fluid was clear. Pandy's reaction was strongly positive and Nonne-Apelt's reaction slightly positive. The total protein content was 0·04 per cent. (Kafka), the number of cells being 195/3. The Wassermann reaction was negative and the hæmolysin reaction (Weil-Kafka) strongly positive. Gold sol and benzoin reactions were normal.

Convalescent serum 80 c.cm. was administered intramuscularly. The state of the patient remained unchanged for some days. He lay on his left side all the time, could not sit up, and complained of giddiness.

From Aug. 14 he had no fever, and his state gradually improved. On the 24th he could raise his right arm a little but could not close his eyes tightly, close his teeth, or open his mouth widely. To chew solid food he was obliged to press his lower jaw against his upper teeth with his hand.

Electrical examination on the 26th showed that the facial nerve was excitable on either side, but the muscles of the third branch of the facial nerve reacted with a slow contraction on direct galvanic excitation. The masseter muscles were not excitable on either side. The right deltoid muscle was excitable to the faradic current.

On the 31st the patient could not raise his right arm in the horizontal plane, but he could flex it at the elbow and then raise it to a vertical position and keep it in this position.

On Sept. 5 he could sit up by himself, but only by supporting his trunk on both elbows and on the occiput.

On the 10th he could walk, but his gait was ataxic. The finger-nose test and the heel-knee test were somewhat ataxic, Romberg's sign was slightly positive, and appreciation of passive movements in the toes was a little uncertain.

Electrical examination showed that the right deltoid muscle and biceps muscle were excitable to the faradic current; their contraction on direct galvanic excitation was slow. The facial nerve on either side was excitable to the faradic current. The masseter and temporal muscles on either side contracted slowly on direct galvanic excitation.

The patient was discharged on the 14th. His state has gradually improved. His gait was undisturbed; all movements were possible, but the right deltoid muscle was a little weaker than the left. The only disturbance that persisted was the weakness of the muscles of mastication. The temporal muscles were atrophic. The patient could open and close his mouth. He opened his mouth with good force against resistance. Closing of the mouth was weaker on the right side than on the left, and on his closing his mouth the right masseter muscle felt

thinner than the left. In opening the mouth the jaw did not deviate to either side. He could move his jaw to the right and to the left. Both masseter and temporal muscles were not excitable by the faradic current, and both masseter muscles reacted to direct galvanic excitation with a slow contraction. He was still obliged, in chewing solid food, to press his lower jaw against his upper teeth with his hand.

COMMENT

The most remarkable symptom in this case is the bilateral paralysis of the masticatory muscles, which is very rare in poliomyelitis and apparently rarer than unilateral paralysis. Most references to paralysis of the masticatory muscles in poliomyelitis do not distinguish between unilateral and bilateral paralysis (Wickman 1911, Pette 1935, Stiefler and Schenk 1932). In case 90 of Lindner and Mally (1910) unilateral paralysis of the muscles of mastication is mentioned. We described a case of poliomyelitis with unilateral paralysis of the masticatory muscles from this hospital (Sittig and Krátký 1936). A young man, aged 22, fell ill with measles. Five days after he recovered from the measles his temperature rose to 102·2° F., and he vomited and sweated profusely. The next day there was retention of urine, and the patient noticed one morning that his whole right leg was paralysed. On examination there was a flaccid paralysis of his right leg, with the exception of the muscles of the sole, with complete reaction of degeneration and absent tendon-reflexes. There was also paralysis of the masticatory muscles on the left side.

We have found two reports of bilateral paralysis of the masticatory muscles in poliomyelitis: case 69 of Lindner and Mally (1910), and the case of Margolin (1926). This latter case is of great interest to us, for the author mentions the same symptom as we observed in our case—i.e., the patient was obliged to press his lower jaw against his upper teeth with his hand in eating solid food. The other symptoms of the paresis of the masticatory muscles were the limitation of opening the mouth and the incompleteness of closing the two rows of his teeth. In the beginning the patient could not move his lower jaw to either side, but later it became possible. When he opened his mouth, the lower jaw did not deviate to either side. The paralysis of the masticatory muscles was degenerative and atrophic. Atrophy of both temporal muscles in the temples was seen. The right masseter muscle was thinner than the left. The temporal and masseter muscles were not excitable to the faradic current on either side. The contraction of both masseter muscles was slow to direct galvanic excitation. We think that not all the masticatory muscles were paralysed; the temporal muscles seemed to be the muscles most completely paralysed, and the masseter muscles seemed not to be entirely paralysed, for one felt their contraction, the right one being weaker than the left; the pterygoid muscles seemed not to be paralysed, for the patient could move his lower jaw to either side and the lower jaw did not deviate on opening the mouth.

There were other remarkable features in our case. At the beginning symptoms of meningitis were present; hence at first, before the appearance of palsies, the diagnosis of meningitis was made. This diagnosis seemed to be confirmed by the result of the examination of the cerebrospinal fluid, for there were an increase of cells and protein content and a positive hæmolysin reaction. It is remarkable that the colloidal reactions were normal. Clinical meningitic features as well as pathological changes of the cerebrospinal fluid of meningitic character are not rare in acute poliomyelitis.

Other rarer symptoms in our case were vertigo, photophobia, and ataxia, which latter could not be observed before the patient began to walk. Ataxia in poliomyelitis has been described by some authors, and an ataxic type of poliomyelitis has been described. Ataxia has been accounted for in this disease by involvement of the cerebellum in the pathological process; but we wish to point out that we found in our case a slight impairment of deep sensibility in the toes; hence, in our case at least, ataxia could be accounted for by the involvement of the pathways of deep sensibility. Other rare symptoms in poliomyelitis are vertigo and photophobia, which have been mentioned by Macnamara (1932).

That our case was one of acute poliomyelitis is, we think, beyond doubt, for degenerative atrophic palsies developed. Our case belongs to the pontine or pontobulbar type of poliomyelitis. One focus must have been in the pons, but other, less severe, foci in the spinal cord, because of the palsy of the right deltoid muscle and the weakness of the neck and back muscles. All these latter palsies improved.

Finally, we wish to insist on the relatively favourable issue in our case. Although we are fully aware that patients with poliomyelitis may recover without any treatment, and that we cannot prove the favourable influence of the convalescent serum administered to our patient, we advise the injection of convalescent serum in every case of acute poliomyelitis, even if palsies have made their appearance, for convalescent serum may perhaps stop further spread of the disease, even if it does not bring about a partial regression of the palsies. Some time ago we reported a case of acute poliomyelitis during pregnancy (Klein and Sittig 1938). This was undoubtedly a serious case of ascending Landry's paralysis, for the respiratory centres in the medulla were involved. We administered convalescent serum intramuscularly to this patient, although there were palsies, and the patient survived.

SUMMARY

A boy, aged 15, suddenly fell ill in August with fever, headache, vomiting, and vertigo. Herpes labialis appeared. On examination he had stiffness of the neck and tenderness of the neck and whole spine to pressure. Lasègue's sign was positive on both sides. There was a weakness of the rectus externus muscle of the left eye, nystagmus, weakness of the muscles of the right facial nerve in all its three branches, paralysis of the masticatory muscles on both sides and of the right deltoid muscle, and weakness of the neck and back muscles. There was photophobia. The state of the patient gradually improved. When he began to walk his gait was ataxic. In course of time all the symptoms disappeared except the bilateral paresis of the muscles of mastication and a slight weakness of the right deltoid muscle.

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THERAPEUTIC ACTION OF M. & B. 693 IN URINARY INFECTIONS

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In view of the recent evidence demonstrating the activity of 2-sulphanilyl-aminopyridine against a variety of organisms, an investigation of the action of the drug in the treatment of urinary infections was undertaken. A total of 71 cases of cystitis and pyelitis admitted to Lewisham Hospital were treated with M. & B. 693. The results of this treatment have proved satisfactory and are summarised in table I.

Table I—cases treated with M. & B. 693

Type of case	Number	Cured	Failures
Acute pyelitis	27	26	1
Chronic pyelitis ..	8	5	3
Pyelitis of pregnancy ..	15	12	3
Puerperal pyelitis ..	2	1	1
Acute cystitis	7	6	1
Chronic cystitis ..	12	6	6
Total ..	71	56	15

In-vitro experiments were also carried out with the object of comparing the action of M. & B. 693 with sulphanilamide on the *Bacterium coli*, and the results of these experiments will be considered later in this paper. A case was only accepted as cured when all symptoms had disappeared and a centrifuged deposit of urine was free from bacteria both on the Gram film and on culture. No additional treatment was given except to 9 patients who received potassium citrate.

DISCUSSION OF CURES

It was observed that patients with acute pyelitis and cystitis responded readily to treatment and were cured after a period of three to seven days, except 2 whose treatment was prolonged for ten days. One patient with acute cystitis had retention of urine after acute poliomyelitis. Most of those with pyelitis of pregnancy were cured in a few days, and one of them with an unidentified non-lactose-fermenting coliform organism responded to therapy after failing to clear up with sulphanilamide. Of the patients with chronic pyelitis who were cured, one had renal calculi and had previously been unsuccessfully treated with sulphanilamide. Among those with chronic cystitis who were cured were 2 suffering from diabetes mellitus and 1 who had undergone prostatectomy.

The commonest organism encountered in this series was the *Bact. coli*. Occasionally other organisms were found alone or together with the *Bact. coli*. Of these the *Bacillus pyocyaneus* and *Staphylococcus albus* responded well to treatment. On the other hand, the *Streptococcus fæcalis* was resistant to M. & B. 693 in the same way as it is to sulphanilamide, though one case of pyelitis of pregnancy caused by this organism was cured. Infections with the *B. proteus* showed a varied response, for, although cures were obtained with several patients, some of the chronic cases did not clear up.

DISCUSSION OF FAILURES

In general, failure has been encountered in chronic urinary infections with a focus of infection, such as a calculus or bladder diverticulum, or with retention of urine—particularly when these conditions have been associated with renal impairment and other debilitating states, such as old age and anæmia. A further factor in failure was the presence of mixed bacterial infections, especially with organisms such as the *Str. fæcalis*, known to be resistant to the action of the sulphanilamide group of drugs. The presence of the complications enumerated above, however, does not necessarily prevent cure, as will be shown later.

Failure occurred in the following cases.

(1) Early unilateral hydronephrosis, with *Bact. coli* septicæmia, blood-urea 116 mg. per 100 c.cm., toxic jaundice, and pneumonia. After M. & B. 693 therapy blood-culture was sterile, blood-urea was normal, and symptoms disappeared. *Bact. coli* persisted in the urine. There was subsequent failure with sulphanilamide.

(2) Chronic retention of urine after tumour of the spinal cord, with uræmic symptoms (blood-urea 89 mg. per 100 c.cm.). After two weeks' therapy with M. & B. 693 urinary symptoms disappeared (blood-urea 32 mg. per 100 c.cm.). Urinary infection (*Bact. coli* and *Str. fæcalis*) did not clear up. Sulphanilamide was also unsuccessful, but *Str. fæcalis* disappeared after treatment with calcium mandelate.

(3) Chronic retention of urine in an old man, with renal and vesical calculi, and blood-urea 86 mg. per 100 c.cm. After M. & B. 693 there was much improvement, the blood-urea being 50 mg. per 100 c.cm. and the urine much clearer, but *Bact. coli* persisted in the urine.

(4) Renal calculi. Subsequent failure with sulphanilamide.

(5) Diabetes mellitus. Previous failure with sulphanilamide.

(6) The patient refused the drug after one day because of vomiting. There was subsequent cure with sulphanilamide, which she was able to tolerate.

(7) Previous failure with sulphanilamide; the patient refused M. & B. 693 after three days.

(8) Severe anæmia. Previous failure with sulphanilamide. After M. & B. 693 the urine was sterile on culture, but organisms were found in Gram film.

(9) Hæmolytic streptococcal urinary infection after abortion. Subsequent failure with sulphanilamide.

(10) *Str. fæcalis* infection. Subsequent cure with calcium mandelate.

(11) *B. proteus* cystitis. After failure with M. & B. 693, a vesical calculus was removed and the patient was then cured with sulphanilamide.

(12) Fractured femur in an old lady. *B. proteus* and staphylococcal infection. Death from uræmia.

(13) *B. proteus* infection in an old lady. Failure also with sulphanilamide.

(14) Enlarged prostate and residual urine. After M. & B. 693 urine culture was sterile but Gram film still positive. There was no further improvement with sulphanilamide.

(15) Diverticulum of bladder in an old man. Subsequent failure with sulphanilamide and calcium mandelate.

DOSAGE OF DRUG USED

Many of the patients received 3 g. of the drug daily, although latterly 1·5–2·0 g. daily has been administered with equally effective results. Three infants received 0·5–1·0 g. daily, which they tolerated well. The total dosage employed has varied from 3 to 45 g. Most of the patients have received 10–20 g. The use of smaller doses in the more recently treated cases, together with more frequent examinations of urine, have shown that the total dosage employed and the duration of treatment are definitely less

than was at first considered necessary. In general, successfully treated cases have required only a few days' therapy.

TOXIC SYMPTOMS

The only symptoms which gave rise to any trouble in my series were nausea and vomiting, the latter in 12 cases. Vomiting as a rule occurred only after the initial dose or during the first day of treatment, the drug being subsequently taken without great difficulty. The preliminary administration of sodium bicarbonate appears to lessen these symptoms. The people most affected by these gastric disturbances were some of the pregnant women and some of the elderly patients, and the use of smaller doses has reduced the incidence of these symptoms. One patient developed a morbilliform eruption. Headache and dizziness were sometimes noted. Marked cyanosis was not observed.

Effects on the blood.—Although Wien (1938), as the result of animal experiments, reported that M. & B. 693 was non-toxic to the blood, the occasional occurrence of leucopenia (Agranat et al. 1939 and Lloyd et al. 1938) and even agranulocytosis (Agranat et al. 1939, Coxon and Forbes 1938, and Johnston 1938) have been noted. Non-fatal agranulocytosis in a patient with pneumococcal meningitis successfully treated has recently come under my notice. Many of the patients in the present series had blood-counts done before and during therapy, and a tendency to leucopenia has been observed in some of the cases, but in only 3 patients did the white-cell count fall below 4000 per c.mm. With regard to the action on the red cells, there does not appear to have been any significant alteration in the cases tested. These results indicate that a toxic action on the blood must certainly be considered; although it is probably less pronounced than with sulphanilamide, caution is necessary, especially when treatment is prolonged.

CONCENTRATION OF M. & B. 693 IN THE URINE

The excretion of the drug in the urine, only estimated in some of the cases, varied from 46 to 190 mg. per 100 c.cm. (estimated as the total of the free and combined acetyl forms). The free form reached a level of 80 mg. in one patient on a dose of 2 g. daily. These amounts are comparable to what is attained with similar doses of sulphanilamide, although in view of the slower rate of excretion of M. & B. 693 (Whitby 1938) the maximal concentration is probably not reached so quickly.

ALTERATION IN THE pH OF URINES OF PATIENTS UNDER TREATMENT

As sulphanilamide increases the pH of the urine (Hartmann et al. 1938 and Helmholz and Osterberg 1937) and as its action is more strongly bactericidal in an alkaline urine (Helmholz and Osterberg 1937 and Mellon and Shinn 1937), it was decided to estimate the pH of the urines of several patients receiving M. & B. 693. None of these patients were being given sodium bicarbonate. The pH of the urines after M. & B. 693 varied widely from 5·3 to 7·7, and there appeared to be no consistent changes. In some the pH was increased; in others it was little altered by the administration of the drug. As will be seen later in this paper, the bactericidal effect of M. & B. 693 depends much less on the pH of the urine than does that of sulphanilamide.

COMPARISON OF M. & B. 693 WITH SULPHANILAMIDE

A comparison of the results obtained by me with M. & B. 693 and those reported with sulphanilamide (Buchtel and Cook 1937, Cokkinis 1938, Cuthbert 1938, Droller 1938, Huber 1936, and Kenny et al. 1937) shows no significant difference in their effect. In the present series, when one drug failed the other usually proved equally unsuccessful. The exceptions to this have been too infrequent for conclusions about the therapeutic superiority of either. The chief disadvantage of M. & B. 693 is that it acts as a gastric irritant in some of the cases, an effect which is greater than with sulphanilamide. It should be noted that in many of the so-called failures in the above series there was often striking improvement in symptoms, although the urine was not rendered sterile. Particularly was this so in the cases of chronic pyelitis and in the one of *Bact. coli* septicæmia with high blood-ureas; in these pronounced clinical improvement was accompanied by a drop in the blood-urea. This shows that M. & B. 693, like sulphanilamide, can be used with safety in the presence of renal damage (Helmholz and Osterberg 1937). Reference has already been made to the fact that it is probably less depressant to the blood than is sulphanilamide.

COMPARISON OF THE IN-VITRO ACTION ON *Bact. coli* OF M. & B. 693 AND SULPHANILAMIDE

(DR. BECK)

With a view to comparing the effective action of the two drugs in-vitro experiments were carried out in which urines with varying concentrations of M. & B. 693 and sulphanilamide were inoculated with *Bact. coli* and incubated for twenty-four hours. To examine the influence of the pH on the bactericidal effect of the two drugs, the urines were tested at different pH (varying from 6·4 to 8·0). The drugs in their free forms [1] were dissolved in the urines, and the latter were then sterilised by filtration through Seitz filters. Volumes of 5 c.cm. of these urines were then inoculated with 0·1 c.cm. of the following dilutions of a four-hour broth culture of *Bact. coli*: 1 in 10, 1 in 100, 1 in 1000, and 1 in 10,000. At the same time viable counts of the culture used were made by the agar plating method. At the end of twenty-four hours viable counts were made with appropriate dilutions (usually three) of each specimen of urine.[2] The results of one of these experiments are shown in table II.

It will be seen from this table that the action of sulphanilamide definitely depended on an alkaline reaction of the urine, a fact already noted by Helmholz and Osterberg (1937). In the case of M. & B. 693 there was almost the same degree of bactericidal action in the acid urine as was found in the alkaline urine. M. & B. 693 was as effective as sulphanilamide, although the latter was present in double the concentration. Seven such experiments were done with five different urinary strains of *Bact. coli*. In general these confirmed the results set out in table II. In each experiment the dependence of the sulphanilamide action on the alkalinity of the urine was very conspicuous, whereas with M. & B. 693 there were no or only slight differences apparent in urines within the different pH ranges tested. One of the

1. No experiments were made with the acetyl form, for Helmholz and Osterberg (1937) have shown that it is far less bactericidal than the free form in the case of sulphanilamide.
2. To exclude any possible inhibitory effect which the M. & B. 693, carried over from the urine into the agar, might exercise on the bacterial growth in the agar, preliminary viable counts were made on agar to which various amounts of the drug had been added. These showed that concentrations of M. & B. 693 such as would occur in 1 in 10 dilution containing 60 mg. of the drug per 100 c.cm. would not reduce the bacterial count on the agar plate.

TABLE II—COMPARISON OF THE EFFECT OF M. & B. 693 AND SULPHANILAMIDE ON URINES OF pH 6·5 AND 7·5 INOCULATED WITH URINARY STRAINS OF *Bact. coli*

pH of urine	Number of organisms inoculated per c.cm. of urine	Number of organisms (per c.cm. of urine) after 24 hours	
		M. & B. 693 (15 mg. per 100 c.cm.)	Sulphanilamide (30 mg. per 100 c.cm.)
6·5	288,000	5350	512,900,000
	28,800	0	2,195,000
	2880	0	11,133,000
	288	0	95,000
7·5	288,000	650	1200
	28,800	0	0
	2880	0	0
	288	0	0

strains examined showed a pronounced resistance against the drugs as compared with the other strains. An experiment with this strain is illustrated in table III.

It will be seen from this experiment that with this particular strain and the relatively low concentrations of the drugs used, the maximal effect obtained

TABLE III—EXPERIMENT SIMILAR TO THAT SHOWN IN TABLE II BUT WITH A RESISTANT STRAIN OF *Bact. coli*

pH of urine	Number of organisms inoculated per c.cm. of urine	Number of organisms (per c.cm. of urine) after 24 hours	
		M. & B. 693 (30 mg. per 100 c.cm.)	Sulphanilamide (30 mg. per 100 c.cm.)
6·5	62,666	1,921,000	161,700,000
	6266	100,160	32,121,000
	626	6800	1,299,500
	63	1205	500,000
7·5	62,666	230,400	5,000,000
	6266	25,680	103,375
	626	2285	40,320
	63	600	12,560

was only inhibition of free growth with M. & B. 693. Even in the alkaline urine there appears to have been a somewhat greater inhibitory effect of M. & B. 693 as compared with sulphanilamide.

Under average conditions, concentrations of at least 30 mg. of sulphanilamide per 100 c.cm. of an alkaline urine were found necessary for a satisfactory bactericidal effect, whereas with M. & B. 693 half this concentration proved effective. In comparing the therapeutic effectiveness of the two drugs the different conditions of absorption and excretion of the two drugs (Whitby 1938) have to be taken into account.

SUMMARY

M. & B. 693 has been tried in 71 cases of urinary infections. In 56 the infection disappeared and in most of the others the symptoms were relieved. It was most successful in acute urinary infections and pyelitis of pregnancy, and was also found useful in chronic cases.

In-vitro experiments on various strains of *Bact. coli* suggest that M. & B. 693 is a more powerful bactericide than sulphanilamide.

Our thanks are due to Sir Frederick Menzies, medical officer of health for the county of London, and Dr. Humphrey Nockolds, medical superintendent of Lewisham Hospital, for permission to treat the cases. The M. & B. 693 used in the clinical trials and in the in-vitro experiments was supplied by Pharmaceutical Specialties (May and Baker) Ltd.

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TYPE III PNEUMOCOCCAL PNEUMONIA

EFFECT OF M. & B. 693

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PNEUMONIA due to type III pneumococcus has the highest fatality-rate of all pneumonias. According to Finland and Sutliff (1934), Lord and Heffron (1938), Gram (1938), and Nissen (1939) the case-mortality in non-specifically treated cases is 50–60 per cent. and rises to 70–80 per cent. in older persons. The last fact is important, for pneumonia due to type III pneumococcus is commoner in older people; thus in Finland and Sutliff's (1934) extensive material 58 per cent. of the patients were between forty and sixty-nine, and 11 per cent. seventy or more. This high fatality-rate persists unaffected in most serum-treated series. Thus Horsfall et al. (1937) reported the deaths of 6 out of 13 patients with type III pneumonia treated with the new rabbit serum; and 2 of Andersen's (1938) 4 serum-treated patients and 2 of Nissen's (1939) 3 patients died. Against this, Gram (1938) has reported that 7 patients with type III pneumonia, treated with serum, all recovered; all but 1 of them suffered from severe serum reactions. Further confirmation of this low mortality-rate will be needed before the general impression of the inefficacy of serum therapy in this type of pneumonia will change.

Because of the dubious results of serum therapy in this special type of pneumonia, and because of the difficulties in procuring specific serum, we have in Department B of the Bispebjerg Hospital in the last two or three months treated all cases of pneumonia due to type III pneumococcus with 2-(*p*-aminobenzenesulphonamido) pyridine (M. & B. 693). It has to be emphasised, however, that the drug has been given only in cases of true lobar pneumonia and to patients with severe bronchopneumonia. Patients with bronchitis or slight bronchopneumonia have had no specific treatment, for we believe that the occurrence of pneumococci in these cases is more or less casual. In this article I report the results of treatment in 6 cases of lobar pneumonia and 2 of confluent bronchopneumonia. The doses and the course of the disease are given in the case-records and in the charts of two representative cases.

CASE-RECORDS

CASE 1.—Female, aged 62. *Lobar pneumonia* (left lower lobe); type III pneumococcus. Severely ill on admission. Treatment with M. & B. 693 was begun on the eighth day of the illness, and the total dose given in three days was 14 g. Her temperature fell immediately, but after a week there was a slight secondary pyrexia. A further 6·5 g. of M. & B. 693 was now given, making the total dose 20·5 g. The patient's temperature became normal sixteen days after the beginning of treatment. During treatment she had slight nausea and vomited several times. No other toxic effects were observed.

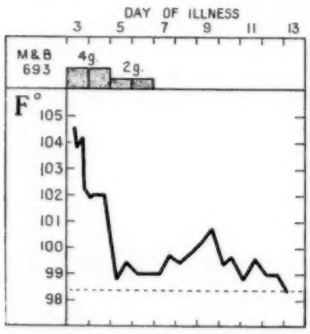

FIG. 1—Temperature chart of case 2 (lobar pneumonia treated with M. & B. 693).

CASE 2.—Male, aged 61. *Lobar pneumonia* (right lower lobe); type III. Moderately ill on admission. Treatment was begun on the third day, and a total dose of 12 g. of M. & B. 693 was given in four days. His temperature fell almost by crisis, and six days later a slight secondary pyrexia was observed, disappearing spontaneously in three days. His temperature became normal ten days after the beginning of treatment. No toxic manifestations. (See fig. 1.)

CASE 3.—Male, aged 68. *Lobar pneumonia* (left lower lobe); type III. Moderately ill on admission. Treatment with M. & B. 693 was begun on the first day of illness, and in six days 24 g. was given. His temperature fell immediately but did not quite reach the normal and stayed subfebrile for twelve days; a few râles were still to be heard. The patient was now allowed out of bed, but evidently this caused a secondary pyrexia, up to 102° F. Consequently 9 g. of M. & B. 693 was given in three days, the total dose thus being 33 g. This caused the temperature to fall, and the normal level was reached in four days—i.e., twenty days after the beginning of the treatment. No toxic manifestations. (See fig. 2.)

CASE 4.—Female, aged 47. *Lobar pneumonia* (right lower lobe); type III. The patient was obese and weighed 15½ st. She was moderately ill. Treatment was begun on the second day of illness, and 14 g. of M. & B. 693 was given in four days. The temperature reacted immediately, but when the drug was discontinued the temperature tended to rise; therefore another 6 g. was given, making the total dose 20 g. The temperature reached the normal ten days after the beginning of the treatment. While taking the drug the patient complained of nausea and there was some vomiting. No other toxic manifestations.

CASE 5.—Male, aged 66. Admitted with *bronchopneumonia* of both lungs due to type III pneumococcus. He also had diabetes mellitus, obesity, and mental confusion. He had been ill for almost three weeks with bronchitis and slight fever, and five days before admission he felt cold and his temperature rose to 101·5° F. He was severely ill on admission, and his blood-sugar was 299 and 310 mg. per 100 c.cm. Treatment with M. & B. 693 was begun at once, and in four days a total dose of 16 g. was given. Insulin (40 units) was given twice daily. The condition, however, gradually became worse and death took place four days after admission and twenty-three days after the onset of illness. Autopsy showed confluent bronchopneumonia in both lungs, especially in the left lower lobe, and highly developed and widespread arteriosclerosis and chronic stasis in all organs.

CASE 6.—Female, aged 62. *Lobar pneumonia* (left upper and right lower lobes); type III. Severely ill on admission. Treatment with M. & B. 693 was started on the fourth day of illness, and in four days 14 g. was given. The temperature fell by crisis to the normal level. A week later a slight secondary pyrexia set in, and, since the temperature remained subfebrile in spite of the satisfactory general condition, 4·5 g. of M. & B. 693 was given. The temperature then fell to normal in three days—i.e., sixteen days after the beginning of the treatment; at the same time the patient was allowed out of bed. During treatment she suffered from nausea and some vomiting, but no other toxic manifestations were observed.

CASE 7.—Male, aged 16. *Lobar pneumonia* (left lower lobe); type III. Moderately ill on admission. Treatment was begun twenty-four hours after the onset of illness, and 12 g. of M. & B. 693 was given in four days. In two days the temperature reached the normal level, where it remained. No toxic manifestations.

CASE 8.—Female, aged 50. Admitted with a diagnosis of *bronchopneumonia* due to type III pneumococcus. She also had chronic bronchitis and bronchial asthma. For several years she had suffered from bronchitis and asthma. She became suddenly ill five days before admission. She was severely ill on admission, with a temperature of 104·5° F. There was signs of bronchopneumonia on the right side, several râles over both lungs, considerable dyspnœa, and cyanosis. During the first two or three days the condition slightly improved; later, however, it grew worse, and signs of bronchopneumonia were now to be found also on the left side. On the tenth day of illness treatment with M. & B. 693 was started, and in six days a total dose of 24 g. was given. In spite of a short temporary improvement the pneumonic processes were further disseminated and death took place sixteen days after the onset of illness. Autopsy showed confluent bronchopneumonia on both sides.

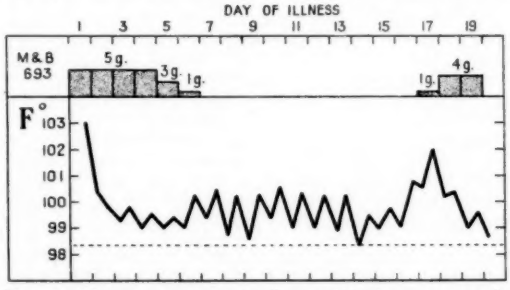

FIG. 2—Temperature chart of case 3 (lobar pneumonia treated with M. & B. 693).

DISCUSSION

It plainly appears that in all the 6 cases of lobar pneumonia treatment with M. & B. 693 had satisfactory results. The drug regularly caused an immediate fall of temperature, almost by crisis; though in most of the cases, a secondary pyrexia was observed three to fourteen days later. In a single case this secondary pyrexia disappeared spontaneously; in the others it reacted promptly to M. & B. 693. Thus final normal temperature was obtained three to twenty days after the onset of treatment. Presumably this secondary pyrexia, noted already by Evans and Gaisford (1938), is due to a further spread of the infection, and most likely

it can be avoided by continuing administration of M. & B. 693 for longer than we have done. The patients in general stood the treatment well; there was vomiting in 3 cases, but more severe toxic manifestations, such as rash, anæmia, and hæmaturia, were not observed.

The 2 fatal cases were not cases of lobar pneumonia; the first was bronchopneumonia in an old obese diabetic, and specific treatment was not begun until nineteen days after the first symptoms. In the second case the patient had suffered for many years from chronic bronchitis, and chemotherapy did not start until ten days after the onset, the patient being then severely ill. These 2 cases thus differ distinctly from the others and are reported merely for the sake of completeness. At the same time they emphasise the importance of early treatment.

From material so limited as this no statistical conclusions can be drawn about either the mortality-rate or the clinical course as a result of treatment with M. & B. 693. We felt, nevertheless, justified in publishing these few cases, for we were much impressed by the mild and short course in the 6 patients, most of them elderly, who suffered from a type of lobar pneumonia which is usually severe and has a high fatality-rate.

SUMMARY

A series of 6 cases of lobar pneumonia caused by type III pneumococcus was treated with M. & B. 693 in total doses of 12–33 g. In all the patients the temperature fell rapidly, but in 5 a secondary pyrexia was observed. The temperature finally came down to normal in three to twenty days after the start of treatment. Apart from vomiting and nausea there were no toxic manifestations. In addition 2 cases of widespread bronchopneumonia due to type III pneumococcus were treated with the drug. Treatment began when the illness was well advanced and it saved neither patient.

Addendum.—Since the completion of this paper we have treated 2 more cases of lobar pneumonia, type III, with M. & B. 693. The effect was equally striking in these cases, and both patients, a man of 47 and a woman of 60, recovered.

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SERUM-POTASSIUM AND SERUM-CALCIUM IN INSULIN SHOCK THERAPY

BY J. L. CLEGG, M.D. Lpool, D.P.H., D.P.M.

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AMONG the many physiological changes which have been described as occurring during hypoglycæmic shock is an alteration in the relative proportions of potassium and calcium in the serum.

Beiglböck and Dussik (1937) state that there is a fall, often considerable, in the potassium content of the serum, but that the calcium content either remains unchanged or increases slightly, in both cases resulting in a fall of the K/Ca ratio. In seeking to explain this change they quote Keller's theory that serum is electrically negative, whereas the cell parenchyma is electrically positive, and that certain ions tend to pass from the cell into the serum whereas others behave in the opposite manner. Included in the first category are sugar, potassium, and non-ionised calcium, and in the second are sodium, ionised calcium, chlorine, magnesium, and many amino-acids. During anaphylactic shock there is an increase in the serum-potassium with a diminution of the serum-sodium. This is the opposite of their findings in hypoglycæmic shock, and they think that it should form a starting-point for the understanding of the latter—namely, that it is in every way the opposite of anaphylactic shock.

TABLE I—SERUM-POTASSIUM (S.-P.) AND SERUM-CALCIUM (S.-C.) IN INSULIN SHOCK THERAPY

Patient	Date	Before injection		At end of coma		K/Ca ratio
		S.-P.	S.-C.	S.-P.	S.-C.	
		Mg. per 100 c.cm.				
A. B.	Dec. 23, 1938	26	—	19	—	—
	Jan. 25, 1939	35	12	26	15	Diminished
	Feb. 2, „	28	10	22	10	„
	„ 6, „	28	11	21	11	„
	„ 8, „	26	10·5	21	10·5	„
C. D.	Jan. 18, „	28	12	19	10	„
	„ 23, „	24	10	16	10	„
	„ 26, „	22	10	19	10	„
	Feb. 2, „	26	10	24	10	„
	„ 6, „	21	11	19	11	„
E. F.	Dec. 23, 1938	26	—	19	—	—
	Jan. 10, 1939	20	10	20	10	Unchanged
	„ 16, „	20	10	20	10	„
	„ 24, „	23	11	23	11	„
	„ 27, „	23	11	20	11	Diminished
G. H.	Dec. 19, 1938	27	—	27	—	—
	Jan. 6, 1939	22	11	22	11	Unchanged
	„ 11, „	28	11·7	23	11·7	Diminished
	„ 12, „	26	12	22	12	„
	„ 13, „	21	13·5	21	13·5	Unchanged

Wespi (1937) attempted to answer the question whether a general alteration of the vegetative system plays a part in producing a cure in cases treated by hypoglycæmic shocks by examining the potassium and calcium contents of the serum at spaced intervals during the course of treatment. An increased serum-potassium content has the same effect as a parasympathetic stimulus, whereas a raising of the serum-calcium content is equivalent to a sympathetic stimulus. He found that widely varying figures were obtained for both ions in any case observed during a long course of treatment, ranging from values below the normal to those greatly above.

Accornero and Bini (1937) investigated the serum-potassium and serum-calcium contents in a number of cases, both before and during coma, and found that the potassium, "after a definite number of shocks, reaches much higher values than normal. During coma it diminishes in some cases in a pronounced fashion, but it always, however, remains much higher than in normal estimations." They found no changes of note in the calcium values.

INVESTIGATION

Four male cases were selected at random, all having been under treatment by hypoglycæmic shocks for at least two months. At varying intervals blood examinations were made, the serum-potassium and serum-calcium being estimated before the morning injection of insulin and again just before the interruption of coma. The method used for the estimation of the potassium was that described by Kramer and Tisdall (1921), whose method for the estimation of calcium was also employed (see Beaumont and Dodds 1926). The figures obtained are given in table I.

Twenty observations of the behaviour of the serum-potassium and seventeen of the serum-calcium were made. The difference in these numbers is due to the fact that the decision to include calcium estimations was only made after the investigation had begun. Except on four occasions, the pre-coma level of the blood-potassium was always above the normal—i.e., 19–21 mg. per 100 c.cm.—and often markedly so, and in no case was it below normal. This is in accordance with the findings of Accornero and Bini (1937). There are fluctuations in the levels in each case, which partly coincides with Wespi's (1937) findings, although, as previously stated, in the present series they are always above the normal. The pre-coma level of the blood-calcium was normal —i.e., 10–11 mg. per 100 c.cm.—in twelve out of the seventeen estimations, and in the remaining five there was only a very slight increase. The changes taking place during hypoglycæmic shock are shown in tables II–IV. These findings substantiate those of

TABLE II—SERUM-POTASSIUM IN HYPOGLYCÆMIC COMA

	Estimations (No. and per cent.)
Lower than pre-coma level	14 (70)
Unchanged from pre-coma level	6 (30)
Higher than pre-coma level	0
Total	20

TABLE III—SERUM-CALCIUM IN HYPOGLYCÆMIC COMA

	Estimations (No. and per cent.)
Unchanged from pre-coma level	15 (88·2)
Lower than pre-coma level	1 (5·9)
Higher than pre-coma level	1 (5·9)
Total	17

TABLE IV—K/CA RATIO IN HYPOGLYCÆMIC COMA

	Estimations (No. and per cent.)
Lower than pre-coma level	12 (70·6)
Unchanged from pre-coma level	5 (29·4)
Higher than pre-coma level	0
Total	17

the investigators previously mentioned, except that in the present series the fall in the serum-potassium and the K/Ca ratio during coma, although common, is not constant.

SUMMARY

The serum-potassium and serum-calcium levels were investigated in four patients undergoing treatment by hypoglycæmic shocks, the estimations being made before the morning injections of insulin and again at the end of coma. The following conclusions were reached.

(1) The "resting" potassium fluctuates, but always above the normal level.

(2) During the coma the potassium tends to fall below its pre-coma level.

(3) The "resting" calcium only occasionally deviates from the normal, and then always above the normal level.

(4) During the coma the calcium tends to remain at its pre-coma level.

(5) During coma the K/Ca ratio tends to fall.

I wish to thank Dr. A. Shepherd, medical superintendent of Barnsley Hall Mental Hospital, for his permission to publish these findings, and the various members of the hospital staff who have assisted with the treatment.

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OXALATE OR CITRATE FOR THE SEDIMENTATION TEST?

BY NORAH H. SCHUSTER, M.B. Manc.
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THE sedimentation test would be a great deal more useful if there were a uniform technique. It is difficult to make progress in studying the effect of disease on sedimentation until there is a common pool for results, and this is impossible with many different methods, each having a different scale of figures. In 1935 the Association of Clinical Pathologists sought to establish a standard technique, and a special subcommittee recommended one to its members. The Empire Rheumatism Council also hope to publish a standard method so as to coördinate their results. One of the chief difficulties is to obtain agreement on the anticoagulant. The subcommittee mentioned above found that citrate solution was satisfactory and was in the most general use at the time, but since then there has been an increasing inclination to use powdered oxalate on account of its greater convenience. The disadvantage of oxalated blood is that it gives unreliable results unless great care is taken with technique, whereas citrated blood is satisfactory under ordinary conditions. In a general investigation of technique it soon became apparent that the diameter of the tube, the time, and the blood-count were much more important problems when oxalate was used, and the following experiments illustrate the greater consistency of results reached with citrated blood.

Blood from a vein was partly mixed with powdered potassium and ammonium oxalate, in the quantities used by Heller and Paul (1934) and others, and partly mixed with a 3·8 per cent. solution of sodium citrate in the proportion of 1 to 4 of blood. The experiments were nearly all done in pairs, and any defect in technique would have been the same for the oxalated and the citrated samples. All the usual precautions were taken to avoid experimental error; the tubes were set up in stands supplied by an instrument firm and as close to the vertical as possible. Patients were always chosen, because the irregularities do not appear when sedimentation takes place at a normal rate.

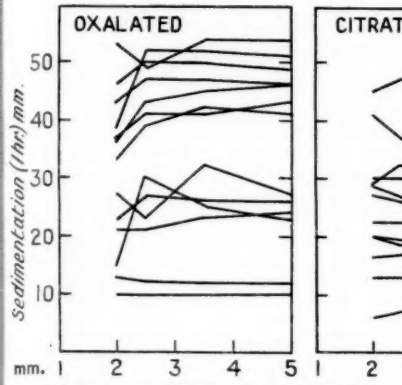

FIG. 1—Graphs showing effect of diameter of test-tube on the sedimentation-rates of oxalated and of citrated blood.

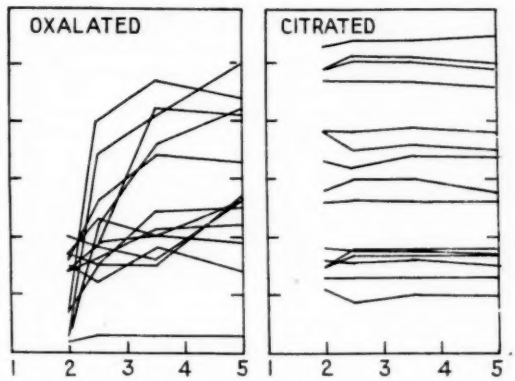

FIG. 2—Graphs showing effect of high concentration of red cells on the sedimentation-rates of oxalated and of citrated blood.

Expt 1: *to ascertain whether tubes of the same diameter give constant readings.*—Each sample of blood was set up in four tubes of the same bore to a height of 100 mm. and the plasma layer read at the end of an hour. "Maximal discrepancy" is the difference between the highest and the lowest readings in the four tubes, and "average discrepancy" is the sum of these maximal discrepancies divided by the number of experiments.

Table I shows that with oxalated blood the readings begin to be irregular when the internal diameter is 2·5 mm. (Westergren's pattern 1921), and that they become more so as it gets narrower. Table II shows that with citrated blood tubes can safely be used down to 2 mm. diameter (Payne's pattern, 1932).

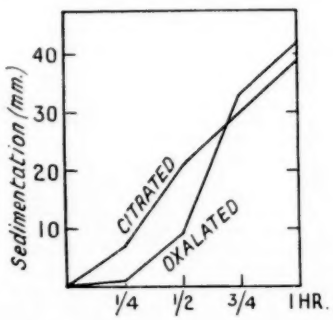

FIG. 3—Graphs showing sedimentation-rate of citrated and of oxalated blood during the first hour.

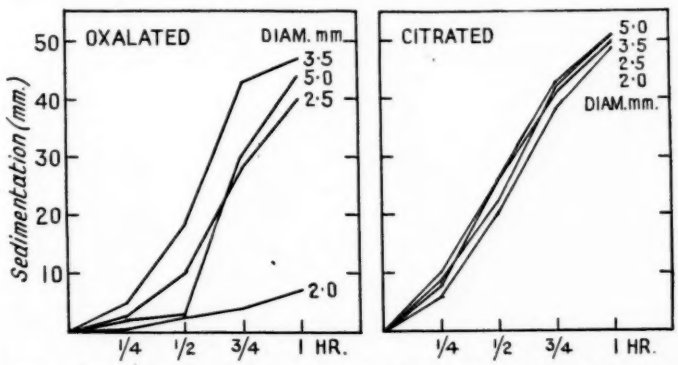

FIG. 5—Graphs showing sedimentation-rates of citrated and of oxalated blood modified to be equivalent to a blood-count of 6,000,000 per c.mm.

Expt 2: *to ascertain whether tubes of different diameter give the same readings with a given sample of blood.*—The results show best in the form of graphs (fig. 1). With oxalated blood there is often a material difference in sedimentation-rate according to the diameter of the tube, and the figures confirm Gibson's (1938) opinion that sedimentation-tubes should have a diameter of not less than 3·5 mm. With citrated blood sedimentation proceeds almost at the same rate in all sizes of tubes, though the 2 mm. tube is slightly erratic. Results that had previously been obtained when observing sedimentation at different blood-counts (Schuster 1938) suggested that the red-cell concentration might have something to do with the irregularities. They seemed to be worse when a high cell-count was combined with the great clumping associated with rapid sedimentation.

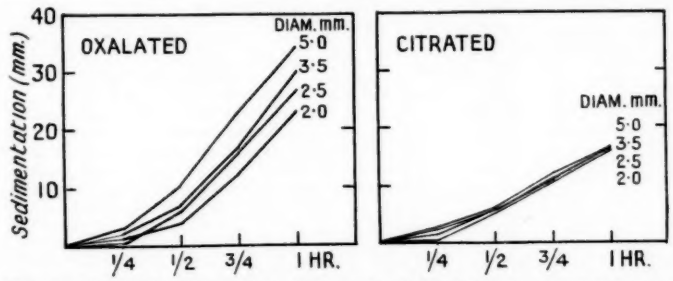

FIG. 4—Graphs showing sedimentation-rate of citrated and of oxalated blood in tubes of different calibre during the first hour.

Expt 3: *to ascertain whether irregular results in tubes of different diameter were increased when red-cell concentration was high.*—The blood was modified so as to be equivalent to a red-cell count of 6,000,000 per c.mm. in the patient. This means that the oxalated sample contained 6,000,000 per c.mm., but that the citrated sample was always less concentrated. It was not considered necessary to experiment with

TABLE I—OXALATED BLOOD

TABLE II—CITRATED BLOOD

Each set up in 4 tubes of the same diameter

Diameter of tube (mm.)	No. of expts	Discrepancy		Diameter of tube (mm.)	No. of expts	Discrepancy	
		Maximal	Average			Maximal	Average
5·0	10	2·0	1·1	5·0	10	2	0·9
3·5	10	3·5	1·45	3·5	10	2	0·85
2·5	10	7·0	3·0	2·5	10	1·5	1·05
2·0	14	29	8·0	2·0	13	3	1·4
1·0	23	35	12·7	1·0	125	11	2·7

citrated blood containing 6,000,000 per c.mm., for this would be equivalent to a red-cell count of 7,500,000, which is too uncommon in practice to bother about.

The graphs (fig. 2) show chaotic results with oxalated blood at 6,000,000. With citrated blood of corresponding concentration the diameter of the tube did not seriously affect the sedimentation-rate.

Expt 4: *to compare the sedimentation of oxalated and citrated blood during the first hour.*—As before, the same blood was partly oxalated and partly citrated, and readings were taken every quarter of an hour for one hour. Sometimes both samples fell at an even rate and gave curves of the usual types, but on several occasions there was a lag at the start with the oxalated sample. A few examples are illustrated by figs. 3–5. Fig. 3 shows sedimentation of the same blood, citrated and oxalated, over a period of one hour in a tube 5 mm. in diameter. The oxalate sample did not attain the maximal rate until half an hour had passed; the citrated sample fell at an even pace. Fig. 4 shows the sedimentation of blood in tubes of different calibre. The rates for oxalated blood were fairly steady, but there was an appreciable difference in the final readings at one hour. The graphs for the same blood citrated agree closely throughout the hour. Fig. 5 shows sedimentation graphs of oxalated and citrated blood modified to be equivalent to a blood-count of 6,000,000 per c.mm. There was great divergence in the rates of the oxalated sample and good agreement with the same blood citrated. These results are rather strange and, if they could be independently confirmed, might be of value to workers in their choice of anticoagulant or size of sedimentation-tube.

SUMMARY

Experiments in the blood-sedimentation test have been done under varying conditions with sodium citrate and potassium ammonium oxalate as anticoagulants. They show that the results obtained with oxalated are less reliable than with citrated blood.

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RECURRENT INTUSSUSCEPTION IN A YOUNG CHILD

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INTUSSUSCEPTION on four occasions in a child of 2¼ years within a period of 18 months is worth recording.

The patient was first seen by me when she was aged 8 months. She was a clear-cut case of advanced intussusception—tumour palpable per abdomen as well as per rectum—with a history of 2½ days' symptoms. She was very ill and was transferred at once to the local cottage hospital for immediate operation. The intussusception was successfully reduced, and the child returned to bed as quickly as possible. She was very ill for the first nine hours, but her further progress was uneventful.

For the next few months her condition was satisfactory, with nothing of interest to report. Then she had a slight attack of bronchitis, and for two days before the second intussusception there was a tendency to constipation, with slight abdominal discomfort and loss of appetite. The onset of the second attack was typical, and diagnosis was made at once by the mother and confirmed by the doctor; hence I was able to operate on the child within a few hours. Since she was in very good condition, I removed her appendix also. The second operation took place at the age of 16 months, again in the local cottage hospital.

In the interval between the second and third operations the child was well except for the appearance of enlarged glands in the neck, which subsided without suppuration or incision. There was slight constipation, relieved by occasional doses of syrup of figs. The third attack came on at 8.30 A.M., just after a breakfast of tea, bread, and butter. There was almost at once pain in the right iliac fossa, together with other textbook signs, and on admission to the Belfast Hospital for Sick Children 2½ hours later a tumour was felt, and a finger inserted into the rectum returned bloodstained.

The child was now 24 months old, and the only difference this time was that the intussusception was at first entirely enteric—that is, ileum into ileum—and later through the ileocæcal valve into the colon, as compared with the first two which were of the typical ileocæcal variety. It is possible that this would have been overlooked had it not been for the mother's now expert knowledge of this trouble, for the enteric variety causes delayed obstruction. The operation was simple and reduction easy, and beyond enlarged glands (common to all these cases) and the mobile cæcum no other morbid condition could be discovered. The fact that this time the variety of intussusception was different from the first two made me feel that any type of artificial binding of the terminal ileum would not prevent the condition from recurring at another situation.

Before her discharge from hospital the child was radiographed. A bismuth enema showed a normal colon, and a through-going bismuth meal showed ileal stasis at four hours. No radio-opaque glands were seen. The child was discharged well, and although the same incision had been used on each occasion—a split right rectus—there was no sign of hernia.

The fourth intussusception took place on Dec. 20, 1937, when the child was 26 months old—two months after the last attack. The child was in good condition on arrival at hospital, although some twelve hours had elapsed since the onset of the attack; hence a bismuth enema was attempted, but she could not retain the fluid. Through the original scar her abdomen was opened and a very large intussusception of the ileocæcal variety found under the liver. The glands on this occasion were fewer than formerly, which was the

only hopeful remark that I could make to the parents, who by now were becoming somewhat tired of these repeated operations on their child. I could not help feeling that they suspected that if the job had been well done the first time it should not have had to be repeated so often.

In this case advanced intussusception occurred four times in a small girl within eighteen months, at the ages of 8, 16, 24, and 26 months. On the first, second, and fourth occasions the intussusception was of the usual ileocæcal variety; on the third it was enteric. Enlarged glands were most conspicuous at the early operations and gradually decreased. The cæcum, ascending colon, and terminal ileum were hypermobile.

The split-right-rectus incision was used on all four occasions, and since healing was always per primum no hernia ensued. I regard this as the best incision for this operation in a child, for it is quick to do and gives splendid anterior and posterior sheaths of rectus to sew up.

The subject of enlarged glands in intussusception is of great interest. Is the enlargement primary or secondary? Is it tuberculous? A recent intussusception operated upon by me was associated with enormous glands; yet the child was still breast-fed. In the present case the onset of the first intussusception was shortly after weaning, and there was always a tendency to slight constipation, as shown by the necessity for repeated laxatives and by the result of the bismuth meal. There was a history of tuberculosis on the mother's side and a Mantoux test of the child was strongly positive.

I have twice seen an intussusception recurring a second time, but four occurrences must be unusual. It would be interesting to know if any surgeon makes it his practice to place sutures in order to produce adhesions and so prevent such a recurrence.

I wish to thank Dr. J. C. Nicholson, of Bangor, co. Down, who had the anxious task of looking after the child, and Dr. C. S. Thomson, late house-surgeon at the hospital, for his helpful notes.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTIONS OF ORTHOPÆDICS, NEUROLOGY, AND RADIOLOGY

AT a combined meeting of these sections held on April 4, with Mr. ROBERT OLLERENSHAW (Manchester), president of the section of orthopædics, in the chair, a discussion on

Prolapsed Intervertebral Disks

was opened by Dr. J. GRAFTON LOVE of the Mayo Clinic. He began by saying he wanted to make it clear that protrusion of an intervertebral disk was by no means the only cause of low back-pain. The prolapse, in his experience, involved both elements of the disk: the nucleus pulposus and the annulus fibrosus. Hernia of the nucleus had been described, but he had never seen it. The prolapse was usually to one or other side of the middle line posteriorly, the reason being that the posterior longitudinal ligament, which was the immediate posterior relation of the disk, was particularly strong in the middle line and distinctly weaker in its lateral expansions. The ligamentum flavum had an important bearing inasmuch as its unyielding nature increased the pressure from the protruding disk. The typical finding at operation was œdema of the posterior nerve-root in the affected segment.

Although Dr. Love was able to give statistics of 300 cases, he emphasised that protruding intervertebral disk was a relatively uncommon condition. Analysis of the Mayo Clinic cases showed that it was three times commoner in men than in women, and that the average age at the time of operation was 40 years. This was no true indication of the age at which the symptoms began, for many cases had a long history of pain. Dr. Love showed a table which demonstrated that by far the greatest incidence of the disease was in the lumbar region of the spine, and that the 4th and 5th lumbar disks were those liable to be affected, thus accounting for sciatica. Of the 300 cases 112 (37 per cent.) gave a history of injury immediately preceding the onset of symptoms; 64 (21 per cent.) had a history of injury not related to the onset; and 124 (41 per cent.) had no history of injury. The questions arose as to what had happened to these patients before the recognition of prolapsed disk, and what operation should be planned for its relief. He had found the history of an operation on one case which had been labelled "enchondroma" and was doubtless a case of prolapsed disk. The extra strain on the back entailed by the upright position had been cited as an auxiliary cause, but he knew of a veterinary surgeon who had operated on a dog for supposed spinal tumour and had found a prolapsed disk.

Cases of prolapsed cervical intervertebral disk were rather rare and caused pain down the arm. Dr. Love described two such cases in which operation had afforded complete relief. In the lumbar spine the dominant symptom was unilateral sciatica. This was present in 215 of 285 cases (75 per cent.). Nocturnal pain was an important symptom, as was the exacerbation of pain by coughing and sneezing. The Achilles-jerk was absent. The type of case in which he expected to find a protrusion of the disk was that of the patient who, after an injury to the back, complained at first of low back-pain which improved only to be followed later on by persistent pain along the distribution of the sciatic nerve. On examination, there was spasm of the erector spinæ muscles and obliteration of the lumbar curve. Examination of the cerebrospinal fluid showed an increase in the total protein, and, finally, radiography after injection of Lipiodol demonstrated a localised narrowing, rarely a block, of the canal. Although increase of total protein in the fluid obtained by lumbar puncture was common, in a third of his cases the figure had lain within normal limits. The amount of lipiodol injected in routine examination was 5 c.cm. They made it a rule never to inject lipiodol in the presence of inflammation and to keep the temperature of the solution under 105° F. Air had been used in place of lipiodol in some of their cases. Dr. Love showed radiograms which demonstrated that air gave not nearly such accurate results. Although he had been very hesitant about introducing non-absorbable iodine oils into the spinal canal he had found no evidence that they did any harm, provided the proper precautions were observed.

The treatment was laminectomy with removal of the protruding cartilage. The ligamentum flavum might be found thickened and should be removed. Sometimes a partial laminectomy gave sufficient

exposure. The posterior longitudinal ligament was usually intact and had to be incised over the protrusion. The œdematous nerve-root was the guide to the position of the protrusion. In some cases the cartilage protruded through the ligament. Altogether 417 cases had been treated by operation, with 1 death, immediate relief being obtained in 90 per cent. The wound healed well without drainage, and in only 7 cases had bone grafting been employed. The patients stayed in hospital two weeks and returned to work in three months. He thought the results of operation for protruding intervertebral disk were as gratifying as in any other branch of surgery. The patients required no brace or support. There was one case of recurrence, and at a second operation he found what he believed to have been a small piece of cartilage overlooked at the first operation.

Dr. C. P. SYMONDS said that his interest in these cases was from the neurological standpoint, and his experience was limited to 22 cases, in 15 of which the pressure had been on the cord and in 7 on the cauda equina. He was concerned with the evidence which would allow of a differential diagnosis of prolapsed disk from other conditions, such as tumours. Important clinical features were the relation of the pain to injury and its exacerbation by coughing and by movements of the spine. The remission of symptoms was especially noteworthy. Cases affecting the lumbar spine showed pain in the lower back which was related to effort and to posture. A point that had been emphasised by Elsberg was that in the sensory loss that might ensue the posterior columns of the cord were spared. This was not altogether true, for in 7 of his cases there was posterior-column loss of sensation. Spinal tumours were distinguished by the fact that on the whole the sequence of events suggested anterior compression, whereas prolapsed disk caused posterior compression. In 1 case bilateral symptoms of compression had followed manipulation of the spine by an orthopædic surgeon, and in 1 case there had been loss of sphincter control. The protein in the cerebrospinal fluid had been estimated in 20 cases, and in 2 only had it been normal. Lipiodol had been used in 8 cases to localise the site of compression. Disseminated sclerosis, with its well-known remission of symptoms, might present some difficulty in differential diagnosis. Cases might possibly have been slipping through the net, and he wondered whether in some an exploratory laminectomy might be justified. The question of sciatica presented some difficulty, for his experience was that 99 per cent. of patients with sciatica eventually recovered, whatever the treatment; they might, indeed, get better more quickly without treatment. How many prolapsed-disk sciaticas, he asked, had recovered with rest alone before the days of diagnosis of the cause? Unless prolapsed disk was anything but a very rare cause of sciatica, it must be a cause which allowed of spontaneous cure. He wanted to know whether the duration of the symptoms and the liability to recurrence were greater or less after operation.

Dr. F. C. GOLDING spoke from the point of view of the radiologist. In the first 29 cases he had radiographed after lipiodol injection he had found evidence of prolapsed disk in 4 only. However, in the last 5, 4 had been positive. The radiogram might be negative and operation reveal a prolapsed disk. He had heard a colleague pity the unsuspecting patient who walked into the orthopædic department nowadays and admitted having sciatica. He thought it very questionable, however, whether the injection of lipiodol was ever followed by bad results. He liked to use the apparatus which was used for the diagnosis of duodenal ulcer, for this allowed four disks to be photographed on one film. The most reliable position for anteroposterior examination was with the patient prone and with the film behind his back and the tube under the table. Lateral views tended to be misleading, and he preferred the oblique picture taken with the suspected side raised. The indentation in the shadow caused by the disks in adolescent kyphosis might be a source of error in diagnosis. Dr. Golding mentioned the case of a young girl with spastic weakness of both legs who achieved a spontaneous cure, attributed by her to the lipiodol injection. André, who had described cases found at necropsy, had noted that the lumbar region was not the commonest site. That made one wonder how many cases had no symptoms.

Mr. JULIAN TAYLOR said that there were three types of pain caused by prolapsed disk: the pain might be in the vertebræ; might be referred pain from the vertebræ; or might be referred pain from the nerve pinched. The last was the most persistent. From his experience of the operation he rejected the theory of hernia of the nucleus pulposus. The substance removed was a white necrotic material. One of his patients, a heavy man, had hurt his back in a cabaret turn with professional acrobats. They threw him in the air and caught him on their feet. He developed an extreme kyphosis.

Mr. A. S. BLUNDELL BANKART described his experience of 4 cases on which he had operated.

Dr. LOVE, in reply, said that the intermittency of symptoms was one of the most valuable signs in the differentiation of protruding intervertebral disk from tumour. Cases had been treated in the old days by bone-graft, but this, apart from other disadvantages, meant keeping the patient in hospital six weeks. He pointed out that no case in the Mayo Clinic ever came to operation for this condition until the orthopædic surgeon had nothing further to offer. If it was considered that other treatment had not had full play, the case was sent back for a while. He agreed with Dr. Golding that a negative radiogram might be given by some cases, and he had operated on 11 cases in which the lipiodol test had been negative. Clinically, the spasm of the erector spinæ muscles was one of the most obvious features; at operation the œdema of the nerve-root was the important sign which led one to the lesion.

The CHAIRMAN said that the cause was an overstress of the back rather than a severe injury.

During the discussion a coloured cinematograph film was shown of the operation of laminectomy and removal of the prolapsed disk as performed by Dr. Love.

SMOKE ABATEMENT IN LONDON.—The first meeting of the Greater London Advisory Council for Smoke Abatement was held at the Ministry of Health on March 29 under the presidency of Mr. E. H. Keeling, M.P. Mr. Walter Elliot, Minister of Health, and Mr. Herbert Morrison, M.P., who addressed the meeting, both emphasised how much of London's smoke pall was due to domestic fires. Dr. J. B. Howell, medical officer of health for Hammersmith, was appointed hon. treasurer, and Dr. H. A. des Voeux, president of the National Smoke Abatement Society, hon. librarian to the council.

LIVERPOOL MEDICAL INSTITUTION

AT a pathological meeting of this institution held on March 16, with Dr. H. WALLACE JONES, vice-president, in the chair, a pathological study of

Hypertensive and Ischæmic Heart Disease

was described by Dr. C. V. HARRISON (Liverpool). The clinical condition, he said, had been investigated during life by Dr. Paul Wood and after autopsy the hearts were examined by a standard technique in which the coronary arteries were injected with barium sulphate and stereoscopic radiograms were taken. The hearts were "cleared" according to the technique of Gross, and histological examination of the coronary arteries and myocardium was afterwards carried out. It was found that hypertensive and ischæmic heart disease, though they might coexist, gave two totally different radiological pictures by this technique. Other conclusions were that coronary atheroma has no effect upon the lumen of the vessels until it becomes severe; that hypertension causes the coronary arteries to enlarge *pari passu* with the hypertrophy of the heart; that in hypertension the weight of the heart increases with the duration of the disease and the degree of cardiac failure; that hypertension alone never gives rise to focal myocardial fibrosis; and that coronary atheroma by itself can lead to cardiac hypertrophy.

Peptic Ulcer

At a meeting of the institution on March 30, with Dr. WILLIAM JOHNSON, the president, in the chair, Mr. F. RONALD EDWARDS read a paper on the neurogenic origin of peptic ulceration. The incidence of duodenal ulcer, he said, is undoubtedly increasing, and since the psychic factor plays an important part in causation he attributed the increase to the strain of modern life. Hyperchlorhydria is constant in duodenal ulcer and produces a duodenitis followed by ulceration. The hyperchlorhydria is due to excessive secretion of gastric juice, and such hypersecretion can be produced experimentally either by a direct action of histamine on the gastric glands or by stimulating the vagus. Mr. Edwards had studied the action of the vagus and the effects of cutting it at various levels. In the normal healthy animal the diminution of the flow of acid from the stomach after section of the vagus was slight, but he believed that section of the vagus in human beings with the "hypersthenic gastric diathesis" might remove the higher cerebral control to the secreting area of the stomach, reduce the excessive acidity, and so allow the ulcer to heal. The anterior branch of the nerve should be divided below the origin of its pylorohepatic branch and the posterior branch below the branch to the cœliac ganglion. The operation had proved perfectly satisfactory in a series of animals, but its value could only be tested by performing it on patients.

Mr. CHARLES WELLS referred to the experimental work of McCrea, and also to Wilson Hey's operation, in which all vessels to the stomach are ligated. This, he said, lowers the acidity, and he wondered whether it might do so because the vagus is divided, either intentionally or accidentally. The occasional failure of operations of the Billroth I or Schoemaker type in duodenal ulceration is attributed to the continued activity of the well-known reflex of psychical secretion of hydrochloric acid, and possibly this might be prevented by interruption of the vagus. It might be useful to re-examine recorded cases in which vagotomy was combined with some other procedure.

Dr. S. B. DARBISHIRE read a paper in which he pointed out that the proteolytic action of the juice is due to the pepsin, and it is surprising that so little attention had been paid to the pepsin and so much to the hydrochloric acid. He showed slides illustrating an apparent relation between the amount of pepsin in the gastric juice and the intractability of the patient's ulcer. A test-meal taken shortly before perforation contained an extremely high concentration of pepsin.

ROYAL ACADEMY OF MEDICINE IN IRELAND

A MEETING of the section of pathology was held on March 24, with Dr. R. A. Q. O'MEARA, the president, in the chair.

Krukenberg Tumour

Dr. G. C. DOCKERAY reported the case of a woman of 37 who went to the Rotunda Hospital in January last, six months after the birth of her third child, and complained of abdominal pain and swelling.

Laparotomy in a general hospital last autumn had disclosed enlarged glands in the omentum, with peritoneal fluid and large ovarian cysts which were not removed; a diagnosis of tuberculous peritonitis had been made. At the Rotunda Dr. J. B. Fleming removed bilateral ovarian solid tumours which proved to be typical Krukenberg tumours with numerous acini and signet-ring cells. At operation a mass had been felt in the region of the stomach and radiography by Dr. F. G. Stewart at Dr. Steevens' Hospital showed advanced carcinoma.

Dr. R. M. CORBET said that in the last three years he had operated on three cases of gastric carcinoma, complicated by an ovarian tumour, all three patients being of child-bearing age. The first patient had Krukenberg tumours in both ovaries, and operation was performed because of the pain they caused. In the second case laparotomy was done for a large left multilocular cystadenoma; when this was removed it was found that the right ovary was enlarged to the size of a walnut and was white and smooth, and subsequent investigation of the gastro-intestinal tract showed extensive cancer of the stomach. The third patient was admitted six weeks after delivery of a full-time infant; she had ascites, with masses in the pelvis, and proved to have a leather-bottle stomach with extensive carcinomatosis of the peritoneum and two ovarian tumours the size of a large orange. These ovarian tumours were removed and turned out to be not Krukenberg tumours as suspected but young, rapidly growing cystadenomata.

Dr. A. R. PARSONS, president of the academy, asked what relation these tumours had to gastric carcinoma.—Dr. J. MCGRATH, referring to one of Dr. Corbet's cases, said that the leather-bottle stomach removed had not the same histology as the ovarian tumour, but it did bear a considerable resemblance to it. In this case the swelling was bigger in the right ovary, and yet the tumour was actually in the left ovary.—Dr. NINIAN FALKINER asked Dr. Dockeray if primary carcinoma of the ovary was more usually bilateral than unilateral. If large bilateral tumours were found, would they not be more likely to be secondary to a growth in the intestinal canal?—Dr. DOCKERAY thought it hard to explain how the cells got from the stomach to the ovary. It was possible that the hormones in the ovary made the soil more attractive. Krukenberg tumours of the ovary were sometimes associated with tumours in the colon or with cancer of the breast.

The Damaged Heart in Pregnancy

Dr. DOCKERAY exhibited a heart showing an extreme degree of mitral stenosis.

He first saw the patient on Feb. 17, 1936, when five months' pregnant in her sixth pregnancy. Her pulse was regular at 110; she had a diastolic mitral murmur with an accentuated second sound; there was a large hydrothorax on the right side and œdema of the lumbosacral region and ankles. She improved greatly with rest, removal of fluid from the right pleural cavity and treatment with Salyrgan. On May 11 labour was induced because œdema reappeared, and she had a live son weighing 4 lb. 11 oz. She next came to hospital on Oct. 28 last, expecting her seventh child to be born in April. She had a regular pulse, was breathless on the slightest exertion and had slight œdema of the ankles and lumbar region. She was treated with rest and salyrgan but miscarried on Jan. 14 and died on Feb. 2. Autopsy showed extreme stenosis of the mitral valve of the button-hole variety; the opening was too small to admit a pencil a fifth of an inch in diameter.

Dr. W. R. O'FARRELL said it was extraordinary that this patient could have survived the strain of so many pregnancies with a mere pinhole opening at the mitral valve.

Dr. CORBET said the case showed that a heart will stand pregnancy far better than is often supposed. He rarely induced labour because of heart disease, since it often added to the worries of the patient. Indeed he thought induction for obstetrical complications was rarely warranted; for example, if the patient had a minor degree of disproportion with heart disease, the best line of treatment was by cæsarean section. The prognosis was really based on how much one could curtail the patient's activities: a patient who became decompensated while leading an active life had a much better prognosis than one who became decompensated while resting. Deaths were often due to lack of coöperation by the patient.

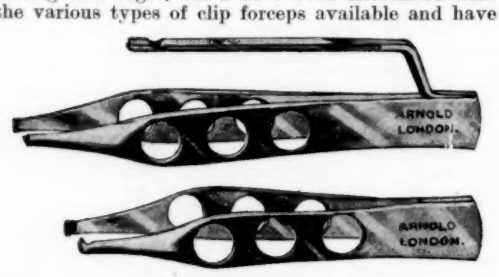
Dr. PARSONS said it was very remarkable that Dr. Dockeray's patient could have gone through six pregnancies. The question was often asked "Should a woman with mitral stenosis marry at all?" He was of opinion that if she did, she should not have any children.

Dr. DOCKERAY, in replying, said that very often in mitral stenosis a second pregnancy was easier than the first. Sometimes the infants in such cases had parts which were softer than normal and therefore the birth was fairly easy.

NEW INVENTIONS

CLIP FORCEPS

Michel's clips are deservedly popular for approximating skin edges, but I have been dissatisfied with the various types of clip forceps available and have



therefore devised a modification which seems to meet my requirements. The design of both skin-approximating and insertion forceps is based on the well-known Jeans dissecting forceps. The instruments which are illustrated here are made of stout-gauge stainless steel with a blocked joint, giving a particularly strong and rigid article which is not unduly heavy owing to the half-inch fenestrations. These fenestrations afford a firm hold even when operating on stout subjects.

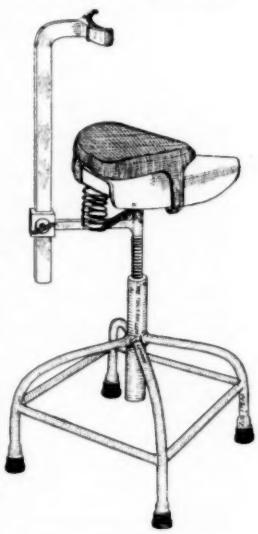
The skin-approximating forceps has fine teeth which approximate accurately and carries a three-inch gallery which holds twenty-four clips—sufficient for almost any length of incision. The gallery on the model illustrated is designed for 16 mm. clips, but could of course be modified to take the more usual size. The clip-inserting forceps is 5 in. long, the teeth are grooved on the inner aspect to ensure a good grip on the clip and are only 0·15 in. wide to avoid picking off more than one clip at a time.

I have now been using these forceps in private and hospital practice for over a year and they have proved most satisfactory. The instruments were made for me by Messrs. Arnold and Sons (John Bell and Croyden), Wigmore Street, London, W.1.

Lincoln. G. A. BAGOT WALTERS, F.R.C.S.E.

AN OPERATING CHAIR FOR THE GENERAL SURGEON

A GREAT deal of energy is wasted in operation theatres, though life is still short and the art longer than ever. Few surgeons seek the repose of green sheets, and many strain their eyes with white (a symbol perhaps of aseptic purity), but why should they stand while they perform long operations? Some of the specialists sit in comfort at the ends of their tables, but the general surgeon, who works most often at the side, stands, we believe, simply because he cannot sit. If he uses an ordinary seat he is either too low or else his bent knees press against some part of the table and keep him away from it. For this reason the chair illustrated here adapts the saddle of a motor-cycle; the surgeon sits astride and so can come close to the table with his knees almost straight, with his feet on the floor but his weight taken off them. The saddle can be raised or lowered and its back is easily adjusted to the surgeon's. A square non-skidding base carries a kind of cocktail amenity in the shape of a rail to which a restless foot can shift; one angle, therefore, of the base should point towards the table so that the raised knee will bend sideways.



This chair—made for us by Messrs. Thackray of Leeds—is of simple design, and will not therefore seat the operator through every possible procedure, a thing that few would wish. It provides, however, an easy change of posture, for the saddle turns readily to mount or dismount, and ample respite from standing is better than full immunity.

We wish to thank Mr. J. Robson, technician in the department of surgery at the British Postgraduate Medical School, for a useful suggestion.

ARNOLD K. HENRY, M.B. Dubl., F.R.C.S.I.
D. K. MILNE-HENRY, M.D. Dubl., D.P.H.

REVIEWS AND NOTICES OF BOOKS

Scarlet Fever

By GEORGE F. DICK, M.D., D.Sc., professor of medicine in the University of Chicago; and GLADYS HENRY DICK, M.D., D.Sc. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1938. Pp. 149. 8*s*. 6*d*.

IN this concise and clearly written monograph Dr. and Mrs. Dick give an account of scarlet fever as a definite and specific clinical entity, although they admit the occurrence and epidemiological importance of subclinical varieties. The type of scarlet fever prevalent in the United States is considerably more severe than that which is now usual in this country, and thus the proportion of clinically complete and typical cases is probably higher there. But there is no real difference in the epidemiological standpoints of the two countries except in so far as these are affected by varying classifications of the *Streptococcus pyogenes*. The late Prof. C. C. Okell in his Milroy lectures for 1932 expounded the "unitarian" hypothesis that the difference between the toxins produced by various strains of the hæmolytic streptococcus is quantitative rather than qualitative. The Dicks maintain, however, that scarlet-fever antitoxin obtained by immunising a horse with a toxin from one strain of a scarlet-fever streptococcus neutralises the homologous toxin and other scarlet-fever toxins, but does not show cross-neutralisation with erysipelas toxin, and that therefore separate toxins are produced by scarlet-fever and by erysipelas streptococci. They maintain also that there is a close clinical and immunological relation between the streptococci isolated from septic sore-throat and the erysipelas streptococci, though these are not bacteriologically identical. From patients with puerperal sepsis the only toxigenic strains recovered were those associated with scarlet fever or erysipelas. The Dicks are not impressed by classifications based upon precipitin or agglutination tests; Lancefield's work is not mentioned and there is only a passing reference to Griffith's serological types. Although the authors would hardly subscribe to the publishers' statement that "the ghost of the difficulty of diagnosing scarlet fever is laid" by their monograph, they do dispose, in a brief and practical way, of the major bogies. Massive and if necessary repeated intramuscular injections of scarlet-fever antitoxin are recommended for the toxic case. The Dicks insist that the ability of the hæmolytic streptococcus to *invade* is dependent upon primary injury of the tissues by toxin; hence the need for early administration of an ample supply of antitoxin to diminish the risk of complications. Their experience coincides with that of most observers that sulphanilamide is of no value in the toxic stage but relieves sinusitis, otitis media and cervical adenitis after this stage has passed.

The book is illustrated by 8 plates in colour which if not highly artistic are at least clear and instructive. It contains a useful list of 188 selected references and an adequate index. Doctors in either general or special practice will find it extremely useful.

National Health Insurance Acts, 1936-1938

By HENRY LESSER, LL.B. Lond., of Gray's Inn, barrister-at-law. London: Stone and Cox. 1939. Pp. 1281. 37*s*. 6*d*.

THE consolidation of national-health insurance statutes in 1936 and the consequential reissue of the voluminous codes of statutory regulations under the authority delegated by the new act have made the present moment opportune for the publication of a comprehensive textbook. Mr. Lesser has brought together the parliamentary and departmental legislation in a weighty and well-edited tome. Nothing seems to be omitted, but doubtless it will not be long before the mills of Westminster and Whitehall grind out the fresh amendments and extensions which break the textbook writer's heart. The Minister of Health himself contributes a personal panegyric by way of foreword to this volume. The author has made full use of the quasi-judicial decisions of the Ministry on questions of liability or title to insurance and also of the cases decided by referees. He gives brief summaries of the general grounds on which medical practitioners' names have been removed from the panel and of the decisions on excessive prescribing. There is not much case law for him to record, but he rightly draws attention to Mr. Justice Rowlatt's decision in 1916 (O'Neill *v*. Middlesex Insurance Committee) on the validity of the medical benefit regulations. The interesting decision in Marrison *v*. Bell (see *Lancet*, March 18, 1939, p. 648) on the question whether an insured person who is absent from his work through ill health can claim to receive his full pay as well as his insurance benefits is, of course, much too recent to be included.

The Diabetic Life

(11th ed.) By R. D. LAWRENCE, M.D., F.R.C.P., physician in charge, diabetic department, King's College Hospital, London; late chemical pathologist and lecturer in chemical pathology at the hospital. London: J. and A. Churchill. 1939. Pp. 246. 8*s*. 6*d*.

THE principal change which has been made in this popular book is in the line-ration diet. Two important alterations have been made since this was first introduced. The carbohydrate ration, or black line, was increased from 5 to 10 g. some years ago, and now the fat ration has been reduced from 15 to 9 g. Thus a diet of 10 lines which used to contain 50 g. carbohydrate, 75 g. protein and 150 g. fat now contains 100 g. carbohydrate, 75 g. protein and 90 g. fat. This is, according to present ideas, a much better balanced diet although the amount of carbohydrate is still on the low side. To those who read his instructions on the use of the diet carefully Dr. Lawrence makes it quite clear that the number of black, or carbohydrate, lines may greatly exceed the number of red, or protein, lines. It would be an advantage, all the same, if in the next edition these instructions were put in much larger type, for unfortunately many doctors and patients still think that the number of red and black lines must be equal. Thus, if the patient has little appetite for proteins he may only take 8 lines and the carbohydrate will be restricted to 80 g. although the patient would like, and be all the better for, double the amount of carbohydrate. The other important change is the description of the new slow-acting insulins, to which 23 pages are devoted. Dr. Lawrence finds that mild cases requiring 10–30 units a day can be completely controlled with one dose of zinc protamine insulin. In some more severe cases, however, the condition cannot be sufficiently controlled with zinc protamine insulin alone and it is necessary to give soluble insulin, either mixed with it or as an evening dose. These patients run more risk of severe hypoglycæmia and it is unwise to aim at complete control. Dr. Lawrence is at

present treating all new cases with zinc protamine insulin but does not advocate changing the type of insulin for patients who get on well with two doses of soluble insulin. This conclusion seems well judged. The descriptions of the use of the insulins are easy to follow and should be very useful to practitioners.

Gas and Air Analgesia

By R. J. MINNITT, M.D. Lpool, D.A., lecturer in anæsthetics, University of Liverpool; director of anæsthetics, David Lewis Northern Hospital. London: Baillière, Tindall and Cox. 1938. Pp. 84. 3*s*.

Dr. Minnitt is to be congratulated on having given practical application to his desire to lessen the pains of labour while facilitating the process and maintaining the patient's general condition. At the present time there is a widespread demand for this type of analgesia in midwifery, and this little book, by one who is largely responsible for creating the demand, will be of help to those who are trying to meet it. Dr. Minnitt gives detailed instruction in technique, with good photographs of different forms of apparatus and an account of the history of the method and of the current regulations of the Central Midwives Board on its use by midwives.

The extent to which gas-and-air analgesia can be made available in domiciliary practice by midwives will depend on whether the board sees fit in the future to modify these regulations. This controversial question is not discussed by Dr. Minnitt. It is the insistence not on the presence of a second person but on the qualifications of that person that raises difficulties. The method carries so little risk to the patient that many now agree that an untrained person could help her to manage the apparatus under the midwife's supervision, and that such a person might safely be allowed in the room for this purpose provided she keeps to the head-end of the bed.

Not only midwives but doctors interested in the method will find this book useful; it contains a note on the application of the gas-and-air analgesia to minor surgery and conservative dentistry.

Emotions and Bodily Changes

A Survey of Literature of Psychosomatic Interrelationships (1910–1933). (2nd ed.) By H. FLANDERS DUNBAR, M.D., Med.Sc.D., departments of medicine and psychiatry, Columbia University. London: Humphrey Milford, Oxford University Press. 1938. Pp. 601. 25*s*.

WORKERS in all branches of medicine are rapidly growing to realise that philosophic solution of the problems of the body-mind relation is not essential for medical progress, and that the physiological disturbances of acute and chronic emotional states are clinically the most important link between what may be called psyche and soma. Such disorders as asthma, "spasmodic" angina, peptic ulcer, ulcerative colitis, Graves's disease, dysmenorrhœa—to name only a few—are now regarded by many clinicians as unlikely to have a bacteriological or dietetic basis, and some observers have noted that they are peculiarly liable to occur in certain personality types and to be precipitated or affected by emotional disturbances. Investigations in this field have recently become so numerous that it is difficult to keep track of them, and it is for this reason, among others, that Dr. Dunbar's balanced and impartial study has so greatly assisted the evolution of medical thought. In the three years since it first appeared the book has indeed become almost a classic. In this edition the author draws attention to a new venture—an attempt to give some account of this rapidly growing branch of study in a new journal, *Psycho-Somatic Medicine*, whose first number was issued in January, 1939.

In an introduction to her second edition, Dr. Dunbar outlines various advances made in the last five years—the growing agreement, for example, on the need, in any disease, to study all the physiological and psychological characteristics of the patient, and the development of suitable methods and centres of research for this purpose. Perhaps most important of all, she draws attention to evidence that illnesses in which psychological factors play a major part are not only resistant to current medical methods of prevention and treatment, but may actually be on the increase at the present time. This fact has already been noted by J. L. Halliday in Scotland, and Dr. Dunbar emphasises her observation that illness of this type is disproportionately expensive to the community because of its recurrent and chronic nature.

The book provides a stimulating and orientating source of information for any doctor ready to look at patients as complete individuals who are more than the sum of their component parts. Differences in outlook and language have made the contributions to this subject something of a jungle, and this guide to its ramifications should encourage a trend which seems likely to be of major importance in the development of medical concepts and practice.

An addition of some 100 titles to the bibliography offers a selection from work recently published.

Textbook of Bacteriology

(2nd ed.) By THURMAN B. RICE, A.M., M.D., professor of bacteriology and public health, Indiana University School of Medicine. London: W. B. Saunders Company. 1938. Pp. 563. 21*s*.

FOLLOWING for the most part on familiar lines this short but well-written book has one or two interesting and unusual features, including a suggestive chapter on electrophoretic charge as related to serological reactions. Difficulties are not always squarely faced and are at times dismissed without explanation. The general plan of the book is, however, excellent, and with a little more attention to detail it should develop into a first-class textbook.

Science in Africa

By E. B. WORTHINGTON, M.A., Ph.D. Camb., director of the Freshwater Biological Association of the British Empire. London: Humphrey Milford, Oxford University Press. 1938. Pp. 746. 10*s*. 6*d*.

THE object of this book by Dr. E. B. Worthington is to review the present position of scientific studies bearing on African conditions and it provides a useful supplement to Lord Hailey's "African Survey." Most of it is devoted to the agricultural and biological sciences, since these are of immense practical import in that continent, but three chapters deal severally with health and medicine, human diseases, and population. It is a pity that the author did not find it possible to include a complete account of work done in these fields since 1934 (the other sections bring the story up to 1936), but otherwise he gives good measure. He must have taken great pains to assemble so much widely scattered material—the bibliography covers 65 pages—and anyone seeking information about research in Africa will be wise to begin by consulting this volume. The dominant impression that remains with the reader is that public health and preventive medicine must demand the constant attention of medical men in the tropics and that those accustomed to conditions at home who take up work there will find it necessary to adjust their outlook.

THE LANCET

LONDON: SATURDAY, APRIL 15, 1939

STERILISATION OF DRESSINGS AND PADS

THE risk of infection has been largely eliminated from operating-theatres; but as Prof. LERICHE pointed out in our last issue, its disappearance is by no means complete, and the sense of security given by routine is often false. Minor degrees of wound sepsis are only too common, and gross contamination is probably less rare than is supposed. In our correspondence columns on March 18 Dr. FILDES and Prof. MCINTOSH drew attention to a form of operative or postoperative infection that is wholly preventable and should never be contracted in hospital—namely, tetanus—and in the following issue Dr. CRUICKSHANK referred to possible contamination by *Bacillus welchii*. The risk of dying from tetanus or gas-gangrene is not one that ordinary surgical patients should be allowed to face, but lately a number of deaths among them have been caused by these spore-bearing organisms, and steps must be taken to ensure that there are no more. The source of infection in the tetanus cases has usually proved to be cotton-wool—used for example as an outside dressing after operation, as padding under plaster-of-paris, as padding for a wooden splint, or as a sanitary pad applied to the vulva in the puerperium.[1] While many surgeons and practitioners realise that wood-wool often teems with bacteria, it is less well known that cotton-wool, both white and grey, is also contaminated by spores, chiefly of anaerobic bacteria. Cotton-wool of all descriptions must be considered dangerous in the condition in which it is delivered by the manufacturers and it should not be used for any purpose in hospital, even for padding splints, without preliminary sterilisation. That the same precautions are likewise needed in private practice is illustrated by CANE'S case [2] in which a little grey wool used as a splint-pad caused the death from tetanus of a healthy man.

Postoperative deaths from tetanus are seldom the result of a failure of the surgeon's personal technique; but it is evident that any surgeon who does not want to be confronted with an accident of this kind should make sure that he is satisfied not only with the sterilisation of his catgut and instruments, but also with the sterilisation of every kind of dressing he uses, whether near a wound or remote from it. There has been far too much confidence in the efficient working of hospital sterilisation plant, and the management of such plant is too often left to those who do not fully understand how it fulfils its function. It must be impressed on the persons concerned that the essential feature of sterilisation in an autoclave is that steam at the appropriate temperature and pressure should penetrate to every particle of the material. Efficiency depends not so much on the maximum temperature as on complete permeation by steam, and a necessary (but sometimes neglected) preliminary to the admission of the steam is that the apparatus should first be evacuated to ensure that no air-pockets remain to block its penetration. For the same reason drums must be packed *loosely*, and towels and gowns must be dry at the time of packing. Particular care is required in packing wool, which, it must always be remembered, is probably harbouring spores; it should not be rolled into large bundles or pressed tightly into the drum. Likewise it is next to impossible to sterilise wool or dressings wrapped in paper parcels—though this is commonly attempted. For each batch of dressings sterilised a continuous barographic record is needed to ensure that the proper vacuum has been created first, and that an adequate pressure of steam has afterwards been reached and maintained. It is not enough to rely on someone glancing from time to time at a dial, for this duty is all too likely to be forgotten.

No system of records however will altogether compensate for uninformed or unintelligent management, and it is courting disaster to rely on comparatively untrained assistants for this essential service. Furthermore, given the best possible workers and the best possible system, there will still be a need for frequent checking of results. There is only one safe way of providing such a check, and that is by bacteriological examination of materials that have passed through the process, not forgetting that anaerobic as well as aerobic organisms may be hidden in cotton-wool. The best plan is to place responsibility for sterilisation, without reserve, in the hands of the hospital bacteriologist.

1. See *Lancet*, March 11, 1939, p. 582.
2. Cane, L. H., *Ibid*, 1938, **2**, 1059.

PSYCHOTHERAPY FOR THE INSURED WORKER

"A matter giving us considerable concern is the large and increasing number of claims where the incapacitating condition is certified as functional nervous disorder. Not only are claims heavy in respect of initial certificates due to this cause, but at later stages of diseases of an organic nature we are required to pay benefit for a longer period in consequence of the supervention of one of these neuroses. We feel strongly that if greater facilities were available for the treatment of this particular class of case, a great advantage must accrue to the insured population and relief will be afforded to the funds of approved societies."

IN these words the chairman of the Prudential Approved Societies drew attention at his last annual meeting to a problem important to all who organise social medicine. It may be that few would go so far as to agree with the view of psychoneurotic illness, expressed by the assistant surgeon-general of the United States Public Health Service, that in America "four in every ten persons applying for medical advice in public clinics and dispensaries are invalided because of mental illness of this type," [1] but there is ample recent

1. Treadway, W. L., *Publ. Hlth Rep., Wash.* 1936, **51**, 181.

evidence [2-5] that the incidence of such illness is well above the figure of 2 or 3 per cent. often given in reports of health-insurance schemes. All the available information shows that psychological disorders are a main cause of the costly and increasing burden laid on health-insurance funds by disablement of over a year's duration. The position of these disorders is rather like that of tuberculosis at the turn of the century before its control was organised as a special service. Most psychological troubles, and the neuroses in particular, should be detected and checked at an early stage if they are to be prevented from becoming very expensive to the community. But even when they are of recent onset, the time required for their adequate treatment places a burden on its resources which is best met by the establishment of special departments and clinics. The task of restoring working capacity should not be left to the general practitioner, who may lack the equipment and certainly lacks the time to undertake it.

The clause in the Mental Treatment Act, 1930, which gave permission to local authorities to organise, separately or as departments of general hospitals, such psychiatric outpatient centres as they might find necessary was intended to meet this need. Unfortunately, in spite of the active encouragement of the Board of Control, the number of these centres is still so small that the increased facilities for treatment since 1930 hardly cover the rise in the incidence of the disorders. The cost of treating the psychoneuroses may be heavy but in the end it is likely to be less than that which falls on the approved societies and on the whole nation from the chronic invalidism to which this type of illness leads. The tendency of local authorities, noted by the Board of Control, "to grudge expenditure on staff needed for psychotherapy" is probably enhanced now by unwillingness to promote schemes involving further outlay when they are faced with new imperative and growing demands—e.g., for air-raid precautions. It is thus unlikely that the next few years will see much acceleration in the rate of increase of centres for adequate psychological treatment, though the uncertainty and insecurity of our times is likely to make the need for them more and more urgent.

In 1940, with the statutory quinquennial valuation of assets of approved societies, schemes for the provision of additional benefits will be put before the Ministry of Health. A real if only a partial contribution to mental and physical health would be to schedule outpatient psychotherapy as an approved benefit—a permissive action, without direct financial obligation to the state, which would give approved societies an opportunity that some of them would surely take. An immediate outcome of this provision would be to relieve the insurance practitioner of the obligation to cope with a group of patients who consume an amount of his time disproportionate to the good he can do them. The effects might be far-reaching in other directions. In its last annual report the Board of Control suggests the staffing of outpatient clinics by part-time physicians as a method of meeting difficulties of personnel besides lightening the burden on whole-time officers. If psychotherapy became an approved benefit funds from this source would help to pay for their services. The prospect of some regular work would encourage suitable psychotherapists to set up in private practice, and skilled treatment for the psychoneuroses might in this way become available throughout the country. Once an outpatient centre is started it should soon become clear to what extent it is really needed and whether it is likely to save money in the long run. The fact that for treatment of this type some payment, however small, is always demanded from the patient would be a safeguard against abuse of the benefit. Some approved societies clearly recognise the psychoneuroses as a main source of incapacity and are in no doubt as to how they should be dealt with. The matter rests between them and the Ministry of Health. It can no longer be regarded as a philosophic problem of the body-mind relation. It is an urgent, practical problem of medical economics.

2. Department of Health for Scotland. Sixth Report on Insured Incapacitating Sickness. 1937. H.M. Stationery Office.
3. Pearson, R. S. B., *Lancet*, 1938, **1**, 451.
4. Smith, M., and Leiper, M. A., *Rep. industr. Hlth Res. Bd med. Res. Coun., Lond.* No. 75, 1938.
5. Walker A. B., *J. R. sanit. Inst.* January, 1939, p. 511.

THE PREVENTION OF EXPERIMENTAL SILICOSIS

THE preliminary account [1] by DENNY, ROBSON and IRWIN of their attempts to prevent experimental silicosis in rabbits by the use of aluminium aroused much interest amongst those responsible for the health of men in industries entailing a dust hazard, and further development of this work has been eagerly awaited. The results of a more detailed study of the phenomenon of silica-solubility depression and of the histological picture produced in animal tissues by silica mixed with aluminium powder are now to hand.[2] The communication comes jointly from the laboratories of the McIntyre mine at Schumacker, Ontario, and the Banting Institute at Toronto, and exemplifies the sort of association between industry and academic medicine which is clearly the right way of tackling common problems. Animal experiments on a larger scale confirm the results previously reported. The gist of the story is that the admixture of very small quantities of aluminium with quartz dust protects the lungs of rabbits from the fibrosis which develops in 5 months in those exposed to quartz dust alone. Inhalation of aluminium dust for 40 minutes before or after the 12 hours of daily quartz dusting is also protective. In animals with a concentration of metallic aluminium in the lung of 1 per cent. or more, no evidence of fibrosis had been detected up to a period of 17 months after the dusting experiment had begun, whereas the control rabbits showed well-developed lesions in 7 months. The inactivation of quartz in the body is not a systemic

1. Denny, J. J., Robson, W. D., and Irwin, D. A., *Canad. med. Ass. J.* 1937, **37**, 1. See *Lancet*, 1937, **2**, 271.
2. Denny, Robson and Irwin, *Canad. med. Ass. J.* March, 1939, p. 213.

reaction but takes place only when aluminium is closely associated with quartz in body cells or fluids; metallic aluminium on being converted into hydrated alumina reduces the toxicity of the quartz chiefly by surrounding the quartz particles with an insoluble and impermeable coating. The inhalation of aluminium dust does not affect the general health of the animals or cause any damage to their tissues. The authors observe that in the amounts and concentrations recommended it could be introduced into a mine without risk of explosion.

That certain natural mineral dusts may modify the action of silica upon the lungs has been known for a great many years. J. S. HALDANE was the leading exponent of the view that shale dusts act as antidotes to the development of silicosis when they are inhaled with the dust of quartz or flint.[3] The stone-dusting of coal-mines with powdered shale was originally introduced to minimise the risk of explosions. The practice was deprecated by those who feared that any advantage gained might be at the expense of a higher incidence of silicosis. The fear was groundless; in fact silicosis seemed to be actually less prevalent in shale-dusted mines, and it was this industrial experience that impressed HALDANE with the protective value of shale dusts. He and his fellow-workers contend in a forcible paper, communicated long after his death,[4] that silicosis is always due to the inhalation of the dust of free silica, and that the apparent absence of silicosis in certain highly siliceous areas such as the Kolar gold-mines is due to the antagonistic effect of the country rock and not to the lack of some positive factor like sericite, as postulated by JONES.[5] KING and ROMAN[6] and WHITEHOUSE[7] have now linked the reputed protective property of shale dust with the solubility theory of silicosis by showing that this dust greatly depresses the solubility of silica in water and in body fluids. Many other substances have recently been found to act in this way; of these metallic aluminium is undoubtedly the most effective, and the mechanism of the depression it brings about is now becoming clear. DENNY, ROBSON and IRWIN show that the silica particles become coated with a layer of "gelatinous hydrated alumina, which on drying forms the crystalline alpha aluminium monohydrate, Boehmite ($Al_2O_3.H_2O$)"; they have had this substance identified through its electron diffraction pattern. As little as 1 per cent. of metallic aluminium admixed with the quartz powder seems to be enough to coat the particles with this impermeable alumina layer, and to prevent the quartz from going into solution. How long the coating will last is still uncertain; the authors give reasons for their hope that even if it is gradually removed by lung fluids subsequent dusting with aluminium powder would provide a fresh coat.

The validity of claims to have prevented silicosis in animals depends, of course, on whether the fibrosis produced in the controls is really a silicotic nodule. DENNY and his colleagues believe that silicosis can be produced in rabbits by exposure to quartz dust for 5 months. Some workers do not admit that the fibrous-tissue picture seen in the lungs of animals dusted for short periods is strictly comparable with that of the silicotic nodules arising in the lungs of men after long years of exposure.[8,9] There seems to be no doubt, however, that where 1 per cent. or more of aluminium is mixed with the silica in these animal lungs, and where the hydrated alumina is shown on staining to be intimately and uniformly mixed with the silica particles, fibrosis does not develop. Whether this "animal silicosis" and its prevention by aluminium can be translated into terms of human pathology and prophylaxis remains to be determined. Experiments are being made at the McIntyre mine to ascertain the best means of dispersing aluminium in a dust cloud in the mine atmosphere. This is the first step of an investigation that will inevitably take long to complete. No speedy solution of the silicosis problem can be looked for on these lines, quite apart from the complication introduced by the infective factor. It would be futile to expect an early or definite verdict on the efficacy of any measure directed against a disease so slow to develop and so chronic in its course.

THE LEAGUE AND OPIUM

NOTWITHSTANDING the defections from the League of Nations its labours on behalf of social and humanitarian objects pursue their even tenor. The advisory committee on the traffic in opium and other dangerous drugs and the Permanent Central Opium Board have been reappointed by the council of the League, the former for three years and the latter for five. The advisory committee is now composed of representatives of Belgium, Bulgaria, Canada, China, Egypt, France, Greece, India, Iran, Mexico, the Netherlands, Peru, Poland, Portugal, Siam, Spain, Switzerland, Turkey, Uruguay, and Great Britain. The United States, though not a member of the League, is also represented on this committee by reason of the great interest it has taken for the last 30 years in the opium question. The members of the reconstituted Permanent Central Opium Board are Sir Atul Chatterjee (India), Sir Malcolm Delevingne (United Kingdom), Mr. H. L. May (U.S.A.), Mr. D. Milicevic (Yugoslavia), Dr. A. Saenz (Uruguay), Prof M. Tiffeneau (France), Mr. M. Salahaddin (Turkey), and Mr. Michael Hansson (Norway). The Japanese representative has retired from the board. The board is apprehensive lest the political changes that are taking place throughout the world may endanger the continuance of its good work, and urges the contracting parties "to consider carefully what steps should be taken to win back for the board the full support of countries that are estranged from the League of Nations." The board is an independent body, to which definite functions have been assigned, and to which non-members of the League as well as members have always been appointed; by its ten years of successful work it merits the support of all governments.

3. Haldane, J. S., *Trans. Instn Min. Engrs*, 1917, **55**, 264.
4. Haldane, J. S., Haynes, F., Shaw, A., and Graham, J. Ivon, *Trans. Instn Min. Engrs, Lond.* In the press. (Delivered at the annual meeting of the Institution on Feb. 15, 1939.)
5. Jones, W. R., *J. Hyg., Camb.* 1933, **33**, 307.
6. King, E. J., and Roman, W., *Biochem. J.* 1938, **32**, 2283.
7. Whitehouse, A. G. R., *J. industr. Hyg.* 1938, **20**, 556.
8. Kettle, E. H., *Proc. R. Soc. Med.* 1930, **24**, 1.
9. Belt, T. H., and King, E. J., *Physiol. Rev.* 1938, **18**, 355.

ANNOTATIONS

MORPHOLOGICAL CONTROLS

EXPERIMENTAL pathologists sometimes sneer at the laborious "treadmill" methods of the thorough morbid anatomist and histologist; who could retort that the momentum and excitements of technical virtuosity may preclude an adequate examination of material and sometimes leads to unjustified conclusions. To anyone familiar with the morphological variations that can be found in the tissues and organs apart from any disease it is obvious that textbook accounts of "normal" histology do not take full account of these and indeed too often perpetuate the galenical idea that the tissues of animals are identical with those of man. Examples of popular misconceptions are innumerable; it will suffice to recall that the changes which take place in the endometrium during the menstrual cycle were until a few years ago interpreted as endometritis and that the presence of epithelium of the intestinal type in the stomach was regarded as a persistence of a normal fœtal state. There is still much to learn about histology.

Until recently, to take another instance, the parathyroid glands were sadly neglected, probably owing to the difficulty of finding them; but now ample amends have been made by Dr. Gilmour, who has drawn on the rich storehouse of histological material which Prof. H. M. Turnbull, F.R.S., has collected and collated at the London Hospital during the last twenty years. In his two earlier papers [1] Dr. Gilmour noted the variations in size and position of the glands and studied their development in the human fœtus; he has now [2] described their normal histology from investigation of over 400 cases. The glands have a loose connective-tissue capsule and a stroma in which there is a varying amount of adipose tissue; they are traversed by capillaries though no lymphatics could be identified. The parenchyma consists of two types of cells: the principal cell which has a basophil cytoplasm and is about 8 μ in diameter, and the oxyphil cell which is larger and shows acidophil granules in the cytoplasm. Both types of cell show morphological variations—the principal cells sometimes have a dropsical water-clear cytoplasm rich in glycogen and the oxyphil cells may develop a darker cytoplasm, probably as a result of degeneration. Dr. Gilmour found that in the fœtus all the cells were of the principal type; they were mostly of the water-clear variety but with increasing age the proportion of dark principal cells gradually rose. The oxyphil cells were not found in subjects under 3 years old, but after this age more and more of them appear and they are often present in very large numbers in the glands of elderly women. Not only glycogen but much pigment and lipoid are found in the cells. The yellow pigment, which is probably a lipofuscin, is not seen in very young children, but it increases in amount up to the third decade and persists throughout adult life. It is usually in the form of a sphere 2–3 μ in diameter and although present in both types of cell is most conspicuous in the oxyphil cells. The lipoid, which seems to consist of free fatty acids, is closely associated with the pigment and like it increases with age; more of it is present in the principal than in the oxyphil cells. In a few glands removed with the thyroid at operation Dr. Gilmour was able to study the Golgi apparatus. It was not possible to demonstrate the network in the oxyphil cells; in the principal cells it takes the form of a tangled mass with no definite localisation in cells arranged in trabeculæ; when the cells are in alveoli it lies between the alveolar lumen and the cell nucleus. Normally the parenchymal cells have a coarse trabecular arrangement in which nodules of water-clear or oxyphil cells may be found in adult life. The oxyphil cells (but never the principal cells) sometimes form alveoli or colloid vesicles and in subjects over the age of 20 cystic vesicles (which may be as large as 300 μ) are an almost constant feature of the glands; on occasion cystic structures are found on the surface of the parathyroids, which are probably remains of the Kursteiner canals.

It is evident that this fine detailed work, which in many respects confirms and in others refutes the observations, based on much less material, of previous workers, merely constitutes a groundwork for a study of the pathological histology of parathyroids. These three papers, in fact, correspond to the controls of the experimental pathologist. But the experimentalist is well satisfied if a relatively small proportion of his animals are set aside for this purpose, whereas the morphological pathologist insists that his controls must greatly outnumber the abnormal cases which are in effect his experiments, though they are ready-made rather than bespoke.

1. Gilmour, J. R., *J. Path. Bact.* 1937, **44**, 431; 1937, **45**, 507.
2. Gilmour, *Ibid*, 1939, **48**, 187.

OVARIAN IRRADIATION IN INCURABLE BREAST CANCER

SOME thirty years ago a number of British surgeons, including Hugh Lett and Sir George Beatson, reported that they had obtained definite improvements, in patients suffering from inoperable breast cancer, after removal of the ovaries. The results were, however, irregular, and on the whole transitory, and the treatment was abandoned. The possibility of producing a functional castration by irradiation, and the recent discoveries concerning the ætiological relationship between mammary cancer and the ovarian follicular hormone, have reawakened interest in this procedure. In 1930 H. Ahlbohm reported from Radiumhemmet, Stockholm, a definite improvement in a considerable number of his patients subjected to functional castration by X rays. In 1936 R. Dresser in the United States observed distinct benefit after this procedure in patients suffering from breast cancer with bony metastases, whereas metastases in other sites did not appear to react. Now G. W. Taylor of Boston [1] presents a series of 50 cases of inoperable breast cancer treated by ovarian irradiation. He finds that among 20 patients who seem to have derived some benefit 9 showed definite regression of bone metastases, ranging from complete regression and recalcification to a change from osteoclastic to osteoblastic bone lesions. Of the 50 cases treated between January, 1935, and April, 1937, 7 are still alive without evident active progress of the disease. Curiously enough, this procedure has very little effect on the course of the disease when applied to young women with operable breast cancer as a prophylactic measure after complete mastectomy.

The reason for the occasional therapeutic effect of a functional castration in inoperable cases of breast cancer with bone metastases is not clear. The procedure leads to a pronounced and persistent diminution in the œstrin excretion and a temporary

1. Taylor, G. W., *Surg. Gynec. Obstet.* February, 1939, p. 452.

increase in the excretion of prolan A. (The persistence of the fall in the œstrin excretion can be used as an indication that functional castration is complete.) But experimental evidence shows that although a carcinoma can be induced in the mamma by œstrogenic hormones, the presence of these hormones is not necessary to maintain the growth of the neoplasm. The fact that the beneficial effects of an X-ray castration are rare and mainly restricted to cases with bone metastases is in accord with the experimental evidence and suggests that perhaps these effects are brought about by functional changes in the pituitary induced by castration. The conclusions reached by Taylor are that artificial menopause is of definite palliative value in about a third of the patients with inoperable or recurrent carcinoma of the breast, and that the most striking and generally the most durable results are seen in the group suffering from osseous metastases. Though adequate data are lacking he thinks it probable that life is prolonged in many of the patients. The procedure does not seem to help patients with visceral metastases. In general the benefit is transitory and capricious, but Taylor thinks that the occasional gratifying results and the virtually negligible inconvenience justify the functional castration of young women suffering from incurable disease.

KYMOGRAPHY OF THE HEART

IN the methods of X-ray kymography of the heart at present employed, of which an account was given by Franklin Wood in our issue of Feb. 4 (p. 249), a lead grid with horizontal slits is interposed between patient and film and either the grid or the film is moved downwards while a radiogram is being taken. The lateral and medial movements of the heart's border are thus recorded on the film as a wavy outline, continuous if the grid is made to move or interrupted with a moving film. As Stumpf has pointed out, the grid with parallel slits gives a true idea of the heart's movements only in those segments that are perpendicular to the part of the heart's outline being recorded; the movement of parts of the outline lying more obliquely tend to be distorted. Barata [1] suggests that a more accurate tracing of the outline of the heart may be taken with a circular grid with slits radiating from its centre. The fallacy in his procedure however is that the heart is not spherical but irregular in contour, so that the circular grid is not likely to fit its outline except where a tracing of a small arc of the heart's border is required, and will cause serious distortion in the region of the middle arc and great vessels. A circular grid also has the disadvantage of giving a blank central area which disfigures the picture. Comparing the several techniques so far suggested the best general tracing of the heart's movements appears to be obtained by the method described by Franklin Wood, using a moving grid with horizontal slits.

A STUDY IN SELF-EDUCATION

GENERAL practitioners who like sometimes to bemoan their hard lot will do well to read a book [2] which tells the story of how the awkward and sensitive son of a farmer came to qualify and practise medicine in a vast rural area in Kansas. His first and only means of transport was a horse and buggy and (possibly from the former) he soon acquired much horse-sense. Dissatisfied with the meagreness of his training—"two courses of lectures of five months each"—he continued his own professional education by every means in his power. Thus practising on animals he improved his operative technique, and his stories of successful "kitchen," and even alfresco, surgery are as delightful as they are inspiring. Later he contrived to continue his studies in Berlin under such masters as Virchow, Waldeyer and Janzen. Finally he returned to Kansas where he built and equipped a large private hospital which, when in full working order, he disposed of for nothing to a charitable organisation. This book is notable in many ways and not least for the simple, vigorous and wisecracking style in which it is written. Being sensitive and humorous the author early learnt to laugh at himself, and throughout life he has preserved that sense of proportion. Much that he has to tell us about the methods of handling patients is common enough experience to the general practitioner, but there is nothing commonplace about his manner of telling it.

A HISTORY OF MEDICAL SOCIETIES

Sir D'Arcy Power suggests [1] that "societies as we now understand the meaning of the word" began to exist in the seventeenth century and that the first in point of age is the Accademia dei Lincei at Rome which was born in 1603. Within the limits of his definition he is no doubt right. Yet since, as he himself points out, man is a curious and discursive animal, it is impossible to suppose that men living in close conjunction and interested in the same points of theology, law or medicine should not long previously have acquired the habit of periodical meetings to discuss with one another their agreements and differences. In point of fact the literary coteries which used to meet in the libraries and bookshops of imperial Rome were almost exactly similar to the informal gatherings out of which the "societies" have mostly developed: less formal no doubt and certainly less permanent, but essentially societies for the purpose of debate and mutual information. It was, one would suppose, the foundation and success of the Royal Society that in this country gave birth to the societies we now recognise, and indeed "the Royal" itself grew out of just such private meetings. Its charter dates from 1662, but fifteen years earlier two groups in London and Oxford had agreed to meet each week in private houses to converse on what we should now call scientific subjects: of these men Glisson in London and Willis in Oxford bear the names best known to the medical historian. After the Restoration these two groups continued their meetings in each others' houses till they agreed to form a society. Such in fact is the history of the foundation of nearly all the bodies noticed in this volume, with one notable exception. The Society of Apothecaries, the first on Sir D'Arcy's list, is not a society in the same sense as the others: it was founded as a craft guild with the constitution and privileges of a City company. The British Medical Association also has grown into something much more than a society, though its branches all over the Empire maintain the characteristic form of meeting for debate. The remaining 32 organisations here described are true "societies as we now understand them," and the

1. Barata, J. S., *Pr. méd.* Feb. 18, 1939, p. 277.
2. The Horse and Buggy Doctor. By Arthur E. Hertzler, M.D. London: John Lane, The Bodley Head. 1939. Pp. 335. 12*s.* 6*d.*

1. British Medical Societies. Edited by Sir D'Arcy Power, F.R.C.S., consulting surgeon, archivist and keeper of records, St. Bartholomew's Hospital, London; hon. librarian, Royal College of Surgeons of England. Reprinted from the *Medical Press and Circular*. London: Baillière, Tindall and Cox. 1939. Pp. 312. 10*s.* 6*d.*

mere list of their names and habitations in London, Edinburgh, Dublin, Glasgow, Manchester, and elsewhere proves how widely the medical profession has felt the need of scientific and social meeting-places for its members. These records of their foundation and development are of more than local interest.

PROLACTIN IN PRACTICE

Now that the experimental and laboratory aspects of prolactin have been well explored its practical value in promoting lactation is on trial in various centres. In Montevideo Prof. Mussio-Fournier and his collaborators [1] have found that on the whole divided doses are most satisfactory. Their usual total dose was 300 mg. of dry powder, 30 mg. being given twice daily, but their experience has led them gradually to increase the dose, and they suggest that they intend to increase it further. They believe that if prolactin is to be successful it must be given as soon as there is any sign of the supply of breast-milk falling off, and the breasts themselves must be well developed. The prolactin they used was prepared according to the methods suggested by Bates and Riddle, and the fact that their more recent preparations were relatively purer did not seem to affect their results. They have not met with any abnormal reactions, but if the milk-supply fails twice during one lactation they think it unwise to give a second course of injections for fear of provoking anaphylaxis. On the other hand, in their experience there is little danger in using the drug after a second pregnancy when it has already been used after the first. When diminished lactation accompanied the reappearance of menstruation they found that quite small injections of prolactin sometimes helped to re-establish the flow of milk. Their results were, however, not uniform in any type of case, though on the whole young mothers appeared to react to hormonal stimulation better than older ones.

ORIENTAL SORE IN ITALY

For over a quarter of a century it has been known that cutaneous leishmaniasis can be contracted in Italy. Prof. Vanni [2] says that the first cases in that country were reported by Gabbi and La Cava in 1910, and that numerous others have been observed since then, especially in Abruzzi. From May to July of last year, he says, there were about 300 cases in that area. The sandflies *Phlebotomus papatasii* and *P. macedonicus* abound in this region, especially near damp walls and stables at sunset, and their range is greater than that of the disease. *P. papatasii* has hitherto been held responsible for oriental sore in Europe,[3] but in three serial thoracic sections of a female specimen of *P. macedonicus*, whose stomach was full of blood, Vanni found the inner wall of the pharynx completely covered with flagellate organisms resembling leptomonas. Some were free in the lumen of the pharynx. He thought that he must be dealing with the leptomonad phase of *Leishmania tropica*. This specimen was caught in the cowshed of a man who had four sons, whose ages ranged from 5 to 13, all affected with cutaneous leishmaniasis. Vanni identified *P. macedonicus* (Adler and Theodor 1931) and *P. perniciosus* (Newstead 1911) among specimens caught last September in Roseto d'Abruzzi. The latter had previously been reported (as regards Italy) only from Sicily and Campania. *P. perniciosus* is a carrier of *L. donovani*, as shown by Parrot, Donatien, and Lestoquard in 1930 and confirmed by Adler and Theodor in 1931, who experimentally infected 83 per cent. of sandflies of this species with leishmania. This species is mainly responsible for infantile kala-azar in the Mediterranean basin, but it has yet to be discovered whether it also carries *L. tropica*, the cause of oriental sore.

1. Mussio-Fournier, J. C., Morato-Manaro, J., and Albricux, A. *Bull. Soc. méd. Hôp. Paris*, March 6, 1939, p. 281.
2. Vanni, V., *Ann. Igiene*, September–October, 1938, p. 520.
3. Patton, W. S., British Encyclopædia of Medical Practice, 1936, vol. ii, p. 129.

MENTAL DISEASE AND CRIME

There are many difficulties in the way of comparing the incidence of crime and insanity in different countries, and conclusions from such comparisons must be drawn with great care. The statistics brought together in a short paper by Penrose [1] appear however to provide clear evidence of an inverse relationship between the development of mental-health services and the need for accommodation in prisons. As a rough guide to the former Penrose takes the number of inmates of institutions for the mentally abnormal, and to the latter the number of sentenced adult prisoners, other than political prisoners. Of 18 European countries those with the largest ratio of mental inmates to population tend to have the lowest ratio of sentenced prisoners. For instance, the two indices for England and Wales are 4·72 and 0·30 per 1000 inhabitants, for Holland 2·64 and 0·52, for Italy 1·97 and 1·26, and for Poland 0·36 and 1·51. As might be expected, the association for the 18 countries is not perfectly regular, but it is sufficient to give a correlation coefficient of −0·62. Even more striking figures are obtained when the number of convictions for specific crimes of violence are considered. The annual death-rate attributed to murder is relatively small in most of the countries whose mental-health services are well developed, and the rate is increased as much as tenfold in some countries where they are poorly developed. The United States and Switzerland, on the other hand, both pay much attention to mental-health services and yet have a fairly high incidence of crime. Various factors may play a part in this association, and Penrose is careful to say no more than that the figures suggest that attention to mental health may help to prevent the occurrence of serious crimes, particularly deliberate homicide.

THE POPULATION PROBLEM

In the growth, or decline, of a population there are four factors at play: the number of births and deaths occurring in the country, which determine the natural rate of increase (or decrease), and the amount of immigration and emigration, which must affect the actual rate of change. Faced with a declining population in the relatively near future it behoves us to consider each in turn and its possible effects. Opening a discussion arranged by the School of Planning and Research for National Development, R. R. Kuczynski, lecturer in demography at the London School of Economics, pointed out last month that emigration from England has been negligible during the last few years; any restrictions on the present movement outwards would have but little effect upon the size of our population. Immigration has been comparatively heavy, particularly from the Irish Free State, but Kuczynski thinks it doubtful whether a really large movement into the country could be secured. The difficulties of adjustment in this respect are also apparent at the present time when the scale of unemployment remains high on the one

1. Penrose, L. S., *Brit. J. med. Psychol.* 1939, **18**, 1.

hand and thousands of refugees vainly seek a securer home on the other. No reduction in mortality, Kuczynski points out, can effectively check a decline in our numbers, though it might slightly postpone its arrival. The most effective change in that respect would lie in the survival of all females from birth to the end of the child-bearing period; but at present fertility-rates even that rate of survival would not ensure a reproduction-rate sufficient to maintain the population. The only means to that end lies in the fertility-rate itself. Fertility has declined, in Kuczynski's view, because most people today want few children, a view which would be generally accepted. A stop in the downward trend of population can be achieved only by a reversal of that outlook on life—that is, by an increasing desire to raise children. At present, according to Kuczynski's calculations, there is no single county of England, urban or rural, with a reproduction-rate sufficient to lead to an increase in its numbers. Even in less precarious times than the present no-one would venture to predict the chances of a reversal of this trend. An optimist has observed that since populations themselves change more rapidly than the views of population experts, the situation may be relied upon to right itself. The less optimistic (or is it more optimistic?) press for a "population policy" to persuade people to reproduce themselves. The pessimist regards it as a question that smacks too much of that which King Canute tried to solve to be amenable to action at all. Even with the best statistics to guide us Kuczynski himself concludes that "we should be very lucky if we succeeded in a policy of encouraging birth." His listeners naturally took the view that a large decline is not an encouraging outlook in a country whose commerce, culture, and vast social services have all been developed on expanding numbers.

PSYCHOGENESIS OF SCHIZOPHRENIA

In his address to the section of psychiatry of the Royal Society of Medicine on April 4 Prof. C. G. Jung, of Zürich, emphasised again the psychological causation of schizophrenia. Following his teacher Bleuler, he would divide the symptoms into primary and secondary, but would equate the primary disturbances with what Janet has called "abaissement du niveau mental," due to a peculiar feebleness of will. Although this is found, too, in hysteria and other neuroses, there is the difference that in them the potential unity of the personality is preserved, as it is not in schizophrenia. Prof. Jung then pointed out further differences between the dissociation that takes place in hysteria and that in schizophrenia, and went on to consider whether the primary schizophrenic disturbance could be attributed to psychological conflicts and other emotional disorders. In his view a neurosis and a schizophrenic psychosis could be continuous phases of the same illness. In a neurosis the patient fights for the maintenance and supremacy of his ego-consciousness and for the subjugation of the resistant unconscious forces. When this fight no longer succeeds and the patient allows himself to be swayed by the intrusions of strange content from the unconscious, there is strong suspicion of schizophrenia. The unconscious forces and contents which now overwhelm him are not peculiar to himself, they are normal constituents of our unconscious mind. They appear in dreams. It is no exaggeration to say that the dreamer is normally insane or that insanity is a dream which has replaced normal consciousness. Sleep is an "abaissement du niveau mental," which leads to a more or less complete oblivion of the ego. We may therefore ask why in schizophrenia it is a pathological condition that is produced and not merely sleep. The comparison however must be made, not with sleep but with something which disturbs sleep—i.e., the dream. Some dreams are personal and derived from conscious impressions, others have a collective character, and exhibit a peculiarly mythological, legendary, or generally archaic imagery. Both types are exemplified in the symptoms of schizophrenia, where, however, the collective type of material prevails.

It is impossible, said Prof. Jung, to appreciate this without a detailed knowledge of historical and ethnical symbols. The schizophrenic state of mind exhibits the same "numinous" quality which primitive people attribute to magic ritual. The primitive view of insanity as possession by a demon is a correct rendering of the psychical condition; the unconscious has of its own volition taken possession of the ego. Whether this has occurred because the ego is weak or because the unconscious is strong is hard to decide. Possibly it is the latter, the abundant archaic material being the expression of a still existing infantile and primitive mentality, an atavistic phenomenon. An analogy may be seen with neuroses: some patients have weak consciousness and little will-power, whereas others, with remarkable energy, are confronted by an almost overwhelmingly strong unconscious determination.

The general question whether schizophrenia is entirely due to psychological causes cannot, the lecturer thinks, be answered. But the importance of the psychogenic aspect needs emphasis, because it influences treatment so much. Even if not very hopeful about a patient, Prof. Jung tries to give him "as much psychology as he can stand": the results had seemed to justify it, and in assessing the benefits of pioneer treatment he believed the psychiatrist should give credit to his intuition and follow his feeling even at the risk of going wrong. In psychotherapeutics enthusiasm is always the secret of success.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 16, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 8.

We regret to report the death of Dr. J. W. Edington, professor of bacteriology in the University of Sheffield, on Saturday last, at the age of 50. He died after a motor-car accident several days previously in which his wife was killed and his younger son injured.

We also have to record that Dr. W. H. Park, formerly director of the bureau of laboratories of the health department of New York city, and an international authority on diphtheria and other infections, died on April 5, aged 75.

Dr. G. F. McCleary is next week going to the United States to take charge of the British Government's welfare exhibit at the New York World's Fair, from the middle of May till the end of October. As we stated last week a section of the British pavilion is to be devoted to the description and explanation of social services, including national insurance and contributory pensions. Dr. McCleary, who was on retirement a deputy senior medical officer of the Ministry of Health, was formerly medical officer of health for Battersea. He was principal medical officer of the National Health Insurance Commission, and is the author of standard works on the social side of medicine in this country.

SPECIAL ARTICLES

THE PAIN OF LABOUR

DISCUSSION AT EDINBURGH

THE eleventh British Congress of Obstetrics and Gynæcology was held in the new Simpson Memorial Pavilion in Edinburgh last week. In the first meeting on April 4, at which Prof. R. W. JOHNSTONE was in the chair, a discussion on the pain of labour was opened by Prof. CHASSAR MOIR, who dealt with the nature of the pain. He began by considering the theories of visceral sensation.

William Harvey, he said, observed that the exposed heart of a young man who had suffered injury to his ribs was itself insensitive and that sensation was only appreciated through the external integument. Lennander believed that the abdominal viscera were entirely devoid of sensation and that pain attributed to them was in reality caused by irritation of the sensitive peritoneum. Ross held that visceral pain travelled to the central nervous system by way of the sympathetic nerves and was then projected or referred by the sensorium into that part of the body innervated by the spinal segment receiving the stimuli. Mackenzie and Head further elaborated this view of the referred nature of visceral pain, including the pain of labour. Recent work by Hurst, Poulton and Ryle suggests that visceral pain is produced by tension of the muscle wall, this being the natural and only adequate stimulus for such pain. They believe, therefore, that true visceral pain does exist apart from, and in addition to, a referred sensation.

The claims that referred pain may be relieved by anæsthesia of superficial structures have not been fully substantiated. It has often been observed that when cæsarean section is performed under local anæsthesia the uterus may be freely incised without sensation, whereas traction on the uterine supports may cause intolerable pain. Forcible dilatation of the cervix, too, always induces severe pain, both in the non-pregnant and in the parturient woman, the mechanism being apparently similar to that of pain due to distension of the œsophagus and gut.

Observations have been made, continued Prof. Moir, on the area to which pain is referred on stimulation of different parts of the uterus. Zuckerman has recently claimed to have shown that nervous connexions exist between the uterus and the 2nd–4th lumbar segments in monkeys, and also that a parasympathetic supply to the uterus is derived from the sacral nerves. A number of non-pregnant women have been questioned regarding the sensations experienced when a sound is passed into the uterus. Prof. Moir has been unable to produce sacral pain, but he has found that the passage of the sound over the internal os almost invariably causes a rather severe deep-seated pain that the woman locates by placing her hand on the abdomen just above the pubis. Manual stretching of the partly dilated cervix in labour will produce a similar pain. Faradic stimulation has failed to produce any sensation.

He has made graphic records of uterine contractions by means of a small balloon inserted high in the uterus above the presenting part. The patients were given a bag to hold in the hand and told to tighten and relax their grip on this according to the severity of their suffering. This was also recorded. It was noticed that the uterine contraction had nearly reached its maximum before pain was appreciated, and the pain remained after the contraction had almost passed off. The pain experienced by the patient is not necessarily proportional to the strength of the uterine contraction. Many women in the last few weeks of pregnancy have strong contractions which are quite painless, and further, the strong contractions in the second stage of labour are often associated with less pain than earlier contractions. The pain of labour appears, therefore, to be mainly due not directly to muscle contraction but to stretching of the lower part of the uterus and the cervix.

During the puerperium there may be fairly frequent contractions but these are often unaccompanied by pain. Further, oxytocic drugs given during the puerperium may produce great activity of the uterus and yet seldom produce discomfort. In Prof. Moir's experiments this was partly explained by the fact that the balloon could only be inserted into the uterus when it was not greatly anteverted, and where there was therefore no obstruction to the free outflow of lochia. Pain, on the other hand, may be experienced in the puerperium when anteversion of the uterus causes a virtual obstruction of the cervical canal. The pain associated with accidental hæmorrhage may be due to sudden distension of the uterus by the effused blood. In spasmodic dysmenorrhœa severe pain may be caused by the uterine muscle being forced to contract when its blood-supply is inadequate—resembling, therefore, the pain of intermittent claudication and angina pectoris. Graphic records of uterine contractions in spasmodic dysmenorrhœa show that they may exert a pressure in excess of the systolic blood-pressure, so that blood-supply must be cut off at the height of the contraction. During labour, however, even the strongest uterine contractions seldom attain a pressure greater than the diastolic blood-pressure, so that a satisfactory blood-flow is maintained.

ITS RELIEF

Dr. JOHN STURROCK recalled that when Simpson introduced obstetrical anæsthesia in 1847 he did so in the face of much bigoted opposition offered by the religious fundamentalists. The employment of chloroform by Sir James Clark when he attended Queen Victoria at the birth of Prince Leopold not only won the day for obstetrical anæsthesia but gave the name to Simpson's method of administering it to produce analgesia—namely, *à la Reine*. In some continental countries there is still no widespread demand for analgesics and anæsthetics, whereas in some parts of the United States the accoucheur can only disregard the demand for shorter and less painful parturition at the risk of his practice. The position in the British Isles seems to be midway between these two extremes. Most general practitioners, at any rate in Scotland, give chloroform à la Reine at the end of the second stage of labour and chloral hydrate or morphia during the prolonged first stage. A caution has recently come from the United States that the demand for analgesia and anæsthesia may be tending to increase the number of cases with feeble expulsive powers of the uterine musculature and increase the necessity for artificial delivery. The indiscriminate use of analgesics and anæsthetics has also had an adverse effect on fœtal mortality and morbidity.

In considering how to relieve the pain of labour

the first problem, said Dr. Sturrock, is to assess the importance of the part played by the emotions. One of the important rôles of antenatal care is to prevent the development of morbid fear by affording an opportunity for the patient to get to know and gain confidence in her attendant before the ordeal. If peace and calm are allowed to reign in the delivery-room, much smaller doses of drugs are needed to relieve discomfort. The criteria of an ideal method of relieving pain in labour are (1) that it does not endanger the life of, or have any adverse effect upon, mother or child; (2) that it abolishes or diminishes pain and the memory of suffering over long intervals; (3) that it does not diminish uterine contraction; (4) that during the second stage it does not prevent the patient from coöperating intelligently with the doctor, so that an antiseptic and aseptic technique can be maintained; (5) that there is no necessity for operative delivery solely on account of the measures to alleviate pain; and (6) that it is simple to use.

Much depends on the nursing facilities available and the personal supervision of the obstetrician. Morphine has long been employed for narcosis in the first stage but it is recognised that two entirely opposite reactions are possible. Sometimes it acts as a sedative and temporarily arrests uterine action, whereas at other times it proves to be one of the best uterine stimulants. The addition of magnesium sulphate is known to enhance the action of morphia. The introduction of morphine-and-scopolamine narcosis constituted an important advance, and this method has been widely used in the past and in some quarters is still gaining popularity. Provided the technique of administration is mastered, and the dangers of overdosage and the occasional idiosyncrasy to hyoscine are recognised, morphine-and-scopolamine narcosis is both safe and efficient. Scopolamine alone has been much employed, but the varying degrees of restlessness which have been encountered detract from its general usefulness. Chloral hydrate in doses of gr. 30 with or without gr. 30 of potassium bromide acts as a sedative rather than an analgesic and allays fear in nervous patients.

The technique suggested by Gwathmey in 1930 is especially popular in the United States. In this an initial dose of gr. ¼ of morphia is given hypodermically and 2 c.cm. of 50 per cent. magnesium sulphate solution by rectum when the pains are recurring every four or five minutes. The dose of magnesium sulphate is repeated after thirty and again after ninety minutes, and with the last dose a rectal injection is given of quinine hydrobromide gr. 20, alcohol 40 minims, ether 2½ drachms and olive oil 4 drachms. It is claimed that the small amounts of the different drugs have a synergistic action. This method has not been completely successful in some centres.

Numerous barbituric-acid derivatives have been employed, sometimes alone and sometimes in combination with hyoscine or other drugs. Restlessness is, however, often troublesome and the successful employment of these substances demands an exacting technique and constant supervision, preferably in a hospital. The rather high proportion of patients exhibiting idiosyncrasy to the barbiturates constitutes another objection. Paraldehyde may be given both by mouth and by rectum, but to procure efficient amnesia and analgesia it must be combined with other drugs. Avertin may be safely employed if the recognised dangers are avoided, the actual administration of the enema being left to a nurse, but its results do not appear to be sufficiently uniform or satisfactory to make its extended use in obstetrics likely.

During the second stage of anæsthesia chloroform, ether, nitrous oxide and oxygen, or nitrous oxide and air, are the methods commonly employed in this country. The advantages of chloroform are its portability, simplicity, speed and certainty of action, and its analgesic as well as amnesic properties, but it has the well-known disadvantages associated with the possibility of syncope or delayed chloroform poisoning and reduction in the strength of uterine contraction. Administered by skilled anæsthetists in hospital Dr. Sturrock considered it reasonably safe. Ether is a most valuable anæsthetic with a wide margin of safety when given by the open drop method; its irritative properties constitute its main disadvantage. Nitrous oxide and oxygen are becoming ever more popular; the gas may be given with or just before each pain, the depth of anæsthesia can be varied quickly at will, labour is not retarded, and no toxic effects are produced. However, a specially trained anæsthetist is essential and the apparatus is cumbersome and costly. Further, there is difficulty in obtaining sufficient relaxation of the uterus for some obstetrical procedures. Nitrous oxide and air is more easily administered and is suitable for self-use by the mothers. The Royal College of Obstetricians and Gynæcologists recommended the extension of Minnitt's method to the practice of midwives, and conveniently portable apparatus is being developed which will make this use possible. Moir in 1937 introduced an apparatus for the administration of a measured quantity of pure nitrous oxide, and patients who have used this apparatus as well as Minnitt's prefer Moir's.

Ethylene and cyclopropane have not been much used in this country; the latter appears to have some advantage in that it is given along with a high percentage of oxygen, thus lessening the dangers to the child. Spinal anæsthesia has given satisfactory results in some hands, but if some other form of anæsthesia is available and is as suitable it is to be preferred for either abdominal or vaginal delivery. Local infiltration of the perineum with 0·5–1 per cent. Novocain can be employed for carrying out an episiotomy or suturing a perineal tear, or even for a low forceps delivery. The anæsthesia does not diminish the uterine contractions nor the pain caused by them. The rapidly destroyed barbiturates—Evipan sodium and Pentothal sodium—are being employed in operative obstetrics. The latter has, on the whole, been found preferable in producing a quieter anæsthesia without excitation. Both are respiratory depressants but no serious depression is usually observed. The use of these drugs is not warranted in hepatic disease such as pregnancy toxæmia, or in sepsis or debility. These drugs do not give sufficient relaxation for either internal or external version. Neither drug inhibits uterine contractility but the secondary abdominal powers may be reduced by pentothal sodium.

DISCUSSION

Mr. J. E. STACEY laid stress on the importance of amnesia in labour rather than analgesia. He felt that the natural remedy of sleep was the best, and he gave instances in which intense pain had induced a state of unconsciousness resembling sleep. He favoured the judicious use of hyoscine to ensure deep sleep between pains and sometimes even during a pain. His own usual practice was to give gr. 30–40 of chloral hydrate repeated after an hour. These doses, he thought, caused relaxation of smooth muscle including the internal os. In the second stage he preferred to give gas and oxygen, but only when a qualified anæsthetist was available. In colicky uterus

with an internal contraction ring, he said, pain may start before there is palpable evidence of contraction, and he thought that much pain of labour was due to muscular spasm, possibly produced by a hormonal substance similar to the "P" substance of Lewis.

Prof. FARQUHAR MURRAY asked how much of the pain felt on passing a sound through the internal os was due to this instrument and how much to the dragging by the volsellum. He pointed out how impracticable it was for all midwives to carry an apparatus for the administration of gas and oxygen, and said that midwives could do much good with a safe and simple liquid mixture containing moderate doses of potassium bromide, chloral hydrate and tincture of opium.

Dr. BETHEL SOLOMONS criticised Prof. Moir's explanation of the pain associated with accidental hæmorrhage. He said that the uterine distension is gradual rather than sudden and that the pain may continue for a long time although the distension has ceased. He thought that little advance has been made in relieving labour pain since the days of Simpson and Smellie. The old remedies of morphine, bromide and chloral are still relied upon for the first stage, while chloroform is still freely used for the second stage although gas is infinitely preferable. He was strongly opposed to the use of chloroform except in the hands of a skilled anæsthetist, since there was little doubt that it was a dangerous drug, and in his view it should be replaced by ether except when the skilled administration of gas and oxygen is possible.

Dr. DORIS GORDON said that in New Zealand the lay authorities had until recently been opposed to the use of analgesic and anæsthetic drugs, and in their earlier work she and her colleagues had to exercise continual personal supervision. Their experience had been that the drugs employed did not prolong labour, cause any harm to the babies, or increase the number of forceps deliveries. The highly civilised women of New Zealand were desperately afraid of the ordeal of labour, and an easy first labour contributed greatly towards their peace of mind in future labours.

Mr. A. A. GEMMELL described the evolution of a method of analgesia suitable for midwives. Various antipyretic drugs were first tried and found unsatisfactory. Urethane in repeated doses of gr. 60 was not successful by itself but was moderately successful when combined with morphine in doses up to gr. ¼. Nembutal was tried in 15–20 cases but was rapidly discarded since there seemed an unduly high proportion of forceps deliveries and of stillbirths. The gas-air method gave very satisfactory results. The administration could be started at any time when the pains began to be troublesome. His frequent practice was to start in the later part of the first stage. It was important to study the frequency of the pains so that the mother could start taking gas before each expected pain.

Mr. J. S. STEELE described the method recently successfully used at the Middlesex Hospital. There they employed pentothal, preferring the less soluble acid to the sodium salt. It had been given orally to 200 women. The drug was started when pains began to cause genuine discomfort, usually when they were coming at 5–10 minute intervals. The initial dose of gr. 6–8 was repeated in three-quarters of an hour and from then until the head was on the perineum gr. 2 was given each 30, 45, or 60 minutes according to the patient's reaction. The women were usually drowsy about half an hour after the onset. They then fell into a light sleep, wakening with each pain but going back to sleep between the pains. When the cervix was fully dilated pentothal was usually supplemented by gas and air. After delivery the women were in a quiet, placid and coöperative state and a final dose of gr. 5 of pentothal was given after the placenta had been delivered. No harmful effects had been detected, but in 7 per cent. of their cases wild excitement, present before the pentothal was administered, was not controlled. However, excitement was never induced by the drug. In this series there had been five stillbirths which could not be attributed to the pentothal. All the live babies breathed spontaneously immediately after delivery. The anæsthesia produced by pentothal was very good but amnesia was not marked; the duration of labour was not lengthened.

Dr. W. A. LISTON described a series of observations carried out in Edinburgh with Seconal. This drug put up in capsules containing gr. 1½ had been used in 40 cases. An initial dose of four capsules was given when pains were well established. In 10 cases the administration was not begun until the cervix was nearly dilated. As a rule two further capsules were given after 6 hours and two more 4 hours later if necessary. The drug had a long-continued effect beginning about 15 minutes after it was given. The maximum period between the start of the drug and delivery was 12 hours in the case of those receiving four tablets only, 22 hours when six tablets were necessary and 26 hours when eight tablets were given. Amnesia was satisfactory in 92 per cent. and complete in 60 per cent. The pains were powerful and no difficulty was experienced with the patients apart from restlessness in half the cases. A quarter of the patients, who had previously been noisy, were very noisy and restless under the drug. About a quarter coöperated well and were quite quiet. A high rate of forceps delivery was found in this series—namely, 32 per cent.—probably partly due to lack of coöperation on the part of the mother. No anxiety was felt for the babies, but a third of them did not breathe immediately after birth. No special methods of respiratory stimulation were, however, needed.

Prof. JAMES HENDRY maintained that the contractions before labour are associated with stretching since they are important in forming the lower uterine segment in the later weeks of pregnancy and may, in fact, cause some dilatation of the cervix. The intense pains of the colicky uterus are due to the absence of relaxation of the cervix and disappear when uterine polarity is established. He thought the most important thing in the relief of pain was the confidence of the obstetrician in the method he adopted. He himself was satisfied with scopolamine and morphine, obtaining satisfactory amnesia in 80 per cent. and in another 15 per cent. a sufficient reduction of distress. Only in about 2–5 per cent. was there sufficient restlessness in the first stage to necessitate the administration of a general anæsthetic. Such an anæsthetic was, however, often required in the second stage, and the third stage was slightly prolonged. He felt that chloroform was safe so long as an adequate intake of glucose and carbohydrate was ensured in the later weeks of pregnancy and during the first stage of labour to lessen the risk of hepatic necrosis. He disliked ether because of the likelihood of pulmonary complications. Spinal anæsthesia was not satisfactory when intra-uterine manipulations were called for, but it produced no complications during the third stage or in relation to the placenta.

Mr. EARDLEY HOLLAND recalled how the allaying of the mother's anxieties by a confident and respected

doctor often greatly reduced her suffering. He thought that training in muscular relaxation was useful and that dietary control in the later months of pregnancy contributed to such training. He prescribed a simple diet with high vitamin and mineral content but low in starch and sugar. He liked to keep his patients light, and with regular weighings an increase could be counteracted readily by diet. Such training increased the speed of the neuromuscular mechanism. He preferred chloral hydrate, morphine and scopolamine, or morphine and rectal paraldehyde, with gas and oxygen for the later stages if an experienced anæsthetist was available. He felt that this latter proviso was necessary; for he had had three cases, two fatal, of pneumonia following the aspiration of vomited material during gas-and-oxygen anæsthesia.

Prof. C. G. LOWRY admitted that he was timid about the barbiturates and preferred morphine and scopolamine or the latter alone, which gave uniformly good results in his hands. Seconal he had found entirely unsatisfactory. He agreed with Dr. Sturrock that it was most important that students, young graduates and nurses should be better taught in the approved methods of relieving pain in labour, but he felt it was difficult to lay down what was safe to teach to students, since methods which were safe in the hands of the teachers might be dangerous in unskilled hands.

MEDICINE AND THE LAW

Alleged Improper Delay in Casualty Department

COMPLAINTS of delay in treating a patient at the Croydon General Hospital were made at an inquest held last month upon a two-year-old boy who died of shock following extensive burns to the face and arms. The parents and grandmother gave evidence which indicated that the child was brought to the hospital at 10.10 in the morning, that nobody looked at the burns till 11.30 and that it was not till 12 that he was taken from his mother's arms and given medical attention. The child died at 5 P.M. The amount of delay was disputed by the casualty house-surgeon and the casualty sister. The house-surgeon was working in the clinic at the time and had other urgent casualty cases to attend. Dr. Edward Burnet, giving evidence as the pathologist who had examined the body, criticised the delay. Where shock was involved, he said, the sooner attention was given the better; he thought it likely that the result would have been different if the operation had been performed within ten minutes of the arrival of the child; every minute lost was a minute towards a fatal termination; "Croydon has a poor appreciation of the value of time." When the coroner pointed out that the case occurred in the casualty department and that even urgent cases could not invariably be treated at once because there might be two or three urgent cases on hand, Dr. Burnet replied that this was a matter for the hospital; they should have a bigger staff; a life should not be jeopardised for want of sufficient staff. The casualty house-surgeon explained that he did not think the child was severely shocked; the child was being kept warm; he would not run any great risk by waiting a little longer while other urgent cases were dealt with. The coroner adjourned the inquest till April 4 in order to hear any evidence the hospital might wish to submit.

On resumption Mr. R. Castle Miller, counsel appearing on behalf of the hospital, cross-examined Dr. Burnet with a view to showing that the delay had not contributed to the fatal result; and Dr. Harold Singleton, for thirty years anæsthetist at the Hospital for Sick Children, Great Ormond Street, said that an anæsthetic should not be given soon after shock. At his hospital it was usual to allow one hour before administering it. The coroner pointed out to the jury that no question arose of criminal negligence; the casualty house-surgeon had done what he thought best; he had other urgent cases to deal with; moreover some experts had taken the view that delay was proper. The jury returned a verdict of death by misadventure, adding a rider that they considered that the Croydon General Hospital was understaffed. Mr. Castle Miller protested that there was no evidence to this effect, and after the coroner had deprecated the addition, the jury withdrew the rider.

There were brisk exchanges between Dr. Burnet and counsel for the hospital, the former observing that he did not criticise the treatment but the delay. He paid his own personal tribute to the fine work done by the hospital and to the devotion of the staff. One unusual incident in the inquest was Dr. Burnet's appeal to the coroner for protection against what he described as scandalous intimidation of a witness in a case which was sub judice. He had received a letter from the local secretary to the British Medical Association. The letter was handed to the coroner but not read in open court. Dr. Burnet said that the writer accused him most unjustly of transgressing against the laws of medical etiquette. The coroner declined to allow the letter to become an issue in the case but summoned the writer, Dr. S. A. Forbes, and informed him that the letter should not have been written to Dr. Burnet while proceedings in which he was concerned were sub judice.

Spermatozoa Count as a Test for Sterility

In a case at Exmouth police-court on March 31 the question whether the defendant was the father of the applicant's child largely turned on the result of an examination of the semen. At the previous hearing in January Dr. W. A. Robb, pathologist to the Royal Devon and Exeter Hospital, said that a blood-test had been inconclusive. The alleged father was said to have been suffering from malaria and to have been taking quinine, and as this might be a factor in causing sterility Dr. Robb had examined his semen. Samples were examined on Jan. 16 and 25 and Feb. 8, the number of spermatozoa found being 20,600, 19,120, and 15,520 per c.mm. The spermatozoa showed a high degree of motility and only a small proportion were malformed. Dr. Robb said that the normal count was 100,000 per c.mm. and that some authorities in this country held that the minimum count compatible with fertility was 60,000. There were, however, cases on record where fertile men had had counts as low as this man's. Dr. Robb therefore gave his opinion that it was unlikely but not absolutely impossible that the man was the father. The magistrates pointed out that the test was done nearly two years after the conception of the child, and they made an order in the applicant's favour. It may be recalled that in an analysis made in the United States last year (see *Lancet*, 1938, **2**, 1476) 25 out of 200 fertile men tested had counts below the 60,000 level.

Gas Fumigation Fatality

At Leeds assizes last week £300 damages were awarded to the parents of a three-year-old girl who had died almost instantaneously after entering a house which was being fumigated with hydrocyanic-acid gas. The house had been sealed up and

pumped full of gas; late in the afternoon the doors and windows were opened to disperse the gas. The child was a friend of the occupiers and often visited them. Her parents contended that it was negligence on the part of the fumigating company and of the Leeds corporation to create a source of danger and give no adequate warning; a guard should have been posted outside the house and persons should have been prevented from entering it. Mr. Justice Wrottesley said that the child had been warned by her father not to go to the house, but, childlike, she went to it, and seeing the door open walked in. The fumigation of the house was a hazardous act and to leave the door open with no danger placard displayed was negligence on the part of the company. He also held the corporation to have been negligent in not taking precautions to ensure the safety of children. The housing director of the Leeds corporation said that 2400 houses had been safely disinfected by the company by this process; since the fatality it had been stipulated that the gates of all houses under fumigation should be padlocked and that a housing inspector should be present during the whole of the time when the houses were being reopened.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE TRAINING OF DOCTORS

ALL speakers at the national congress on medical education agreed that there is urgent need for reform if the country is to have a well-trained and ethically sound medical profession. Up to now students have been able to postpone taking all their examinations until the end of their fifth year. The disadvantage of this system is that those who are unfitted to become doctors do not realise the fact until their five years are up, and the examiners have not the heart to discard them at that late stage. Regulations to correct this evil have so far failed because they were not enforced. Ways were also found to circumvent a regulation on the German model introducing a compulsory year's hospital practice between passing the final examination and starting in practice; some students, for example, obtained certificates of hospital attendance when they were in fact in practice in another part of the country.

The congress emphasised the inadequacy of the present standard of qualification in Hungary. A proper standard is perhaps all the more important in this country because the state is responsible for placing the diploma holders. What is it to do with the inefficient ones, who interfere with the livelihood of their better-trained colleagues? Dr. Emil de Grosz holds that a third of medical students are ambitious and talented; a third are mediocre; and a third are quite unfitted to become good doctors. He showed ten years ago that students who pass their matriculation with only a "sufficient" classification prove a failure at the universities. Now, when there are 10,600 doctors in the mutilated remains of Hungary and 5000 in Budapest alone, the elimination of the hopeless third is not only justified but essential.

A further point brought out at the congress was that students should do their year's compulsory military service before enrolling at the universities. The present system of serving it in two parts greatly disturbs the course of study. They now do their first half-year in their second or third year, serving as regular soldiers with the infantry, artillery, or cavalry, and spend their second half-year as sub-lieutenants in a military hospital after graduation. Since the introduction of a compulsory health examination for would-be medical students they are fit for military service almost without exception.

The congress outlined a curriculum of training by which two years will be given to the preliminary subjects (anatomy, histology and embryology, physiology and biochemistry) with an examination at the end of each year, and three years to clinical work, the third examination being taken at the beginning of the sixth year. The sixth year will have to be passed in a hospital, and at its end there will be a month's course in practical hygiene and forensic medicine, with an examination. Some members of the congress urged that a special study should be made of medical ethics, but the majority rejected the idea, on the grounds that there are no special medical ethics, for moral laws are the same for all and ethics can only be taught by example. Those who wish to become municipal, district, or social-insurance doctors must produce a certificate of having done two years' hospital practice, and special training will be necessary for medical officers of health and school doctors. The congress has submitted its resolutions to the Supreme Educational Board, and after ministerial approval the next step will be the drafting of a detailed curriculum. In this care will be taken to leave students ample time for meditation, general reading, learning foreign languages, and sport.

RESTRICTIONS ON JEWS

The law made about six months ago allowed Jews to occupy 20 per cent. of all trades and occupations, except government appointments. According to the law now drafted the proportion of Jews in the so-called free occupations—medicine, the law, and engineering—must not exceed 6 per cent. Exception is made in the case of Jews who won certain distinctions in the late war for bravery or special services, and these are not included in the 6 per cent. The law lays down that the Medical Chamber must not enrol new Jewish members until the proportion falls below the 6 per cent. level. Those Jewish doctors who are already members of the chamber may carry on their practices undisturbed. Seeing, however, that of the 10,600 doctors in Hungary about 4000 are of Jewish descent it will be a generation before the 6 per cent. is reached. Until then no new Jewish doctors will be enrolled. The bill is certain to be passed, so that it will be a waste of time for Jewish young men to enter the universities as medical students.

SYMPOSIUM ON VITAMIN E.—The nutrition panel of the food group of the Society of Chemical Industry are holding an all-day meeting at the London School of Hygiene, Keppel Street, W.C.1, on Saturday, April 22, which will be devoted to a discussion on vitamin E. Prof. P. Karrer (Zürich), Dr. A. Emmerie (Utrecht), and Mr. E. Lester Smith will speak on its chemistry; Mr. Karl E. Mason (Vanderbilt University, Tennessee), Mr. S. W. F. Underhill, Mr. T. Moore, Miss A. M. Copping, Prof. V. Korenchevsky, M.D., Mr. B. P. Wiesner, Ph.D., and Mr. A. L. Bacharach on its physiological action; Dr. E. Vogt-Möller (Copenhagen), Dr. E. Shute (University of Western Ontario), Mr. D. W. Currie, F.R.C.S., Dr. G. C. M. M'Gonigle, and Mr. C. R. Macdonald, F.R.C.S.E., on the clinical and veterinary uses of wheat-germ oil and vitamin-E preparations. Further information may be had from the secretary of the society, Clifton House, Euston Road, London, N.W.1.

CONTROL OF THE COMMON FEVERS

EPIDEMIC CATARRHAL JAUNDICE

Reviewed by DR. W. N. PICKLES, *medical officer of health, Aysgarth*

GREAT interest has been shown on the subject of epidemic jaundice in recent years both in this country and abroad. Those of us who were qualified before 1912 found no mention in medical textbooks of epidemic jaundice beyond a description of a serious form named "Weil's disease." Cockayne (1912–13) published an article distinguishing between this and a milder form, which he named "epidemic catarrhal jaundice," the symptoms of which corresponded closely with those of catarrhal jaundice as usually seen. This disease had not hitherto been regarded as infectious. Later, when the serious form had been shown by Inada and Ido in 1915 (Inada et al. 1916) to have a definite bacteriology, and the *Spirochæta icterohæmorrhagiæ* had been demonstrated not only in sufferers among our troops in France during the Great War but also by Gulland and Buchanan (1924) among coal-miners in East Lothian, it was sought to prove that Cockayne's milder form was also due to this spirochæte, but without success, for no evidence in favour of this suggestion was forthcoming. On the contrary, epidemiological and clinical observations showed a wide gulf between the two diseases, and Cockayne's distinction, made on clinical grounds and before the discovery of the spirochæte, was amply justified. Without entering into the details of this distinction, it may be stated that it is universally agreed that the "epidemic catarrhal jaundice" described by Cockayne is not due to the same causal organism as is Weil's disease. Besides the presence or absence of this organism and a different clinical picture and epidemiology, help is obtained in the differential diagnosis by a study of the blood-picture. Many observers, including Gulland and Buchanan (1924), have observed in spirochætal jaundice a leucocytosis with absolute and relative increase in polymorphonuclear cells. In non-spirochætal infectious jaundice Findlay, Dunlop, and Brown (1931) mention a definite fall in these cells and a corresponding rise in the lymphocytic series of cells.

Later Hurst and Simpson (1934) sought to distinguish between instances of true catarrhal jaundice and mild hepatic necrosis. Although fully alive to the clinical distinction which they propound, I suggest, both from a study of reported cases and from personal experience, that the two variations occur in the same epidemics and have the same epidemiological behaviour. No organism has been discovered as a cause of either of these variations, and experiments on animals have yielded negative results; but, if these variations do occur in the same epidemics, it is probable that there is a common causal agent, probably an ultramicroscopic virus.

Epidemiological studies suggest that the disease is transmitted by direct contact, probably by droplet infection; that the incubation period is about a month; and that there is some evidence of a short period of infectivity.

INCUBATION PERIOD

There is considerable evidence of a lengthy incubation period. In this country this was first suggested by Booth and Okell (1927–28), who considered the period to be not less than 20 and not more than 40 days. Other observers have agreed with this, but there are dissentients—i.e., Glover and Wilson (1931) give 3–4 days, and Morgan and Brown (1927) give 4 days in some instances but sometimes as long as 30 days. In an extensive epidemic in Wensleydale in 1929–30 Lethem and I believed we had conclusive evidence of an incubation period of 26–35 days, and this was confirmed in a later small epidemic in 1935–36. The following details, shown graphically in the accompanying chart, of an outbreak beginning in May, 1938, give further evidence.

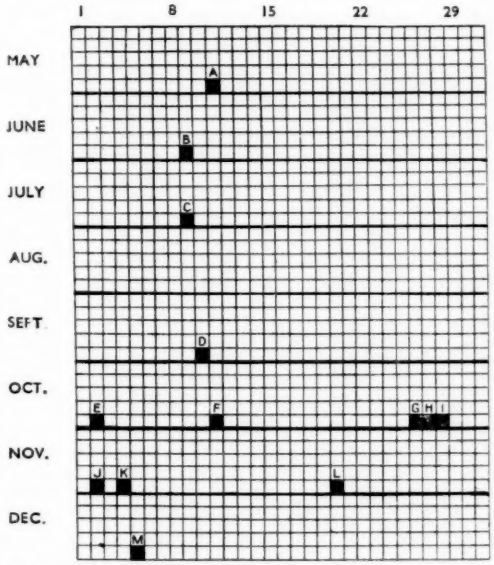


Chart illustrating incubation period of epidemic catarrhal jaundice. Each square represents one day.

A little girl (A) came from Leeds on April 29 to make her home with relations in a village where there is a large school serving a wide area. There were no sufferers from jaundice in this area at the time, and it is probable that she was infected before she left Leeds. Her illness began on May 11.

The next victim (B), also a girl, fell ill on June 9, an interval of 29 days, and the next (C) on July 9, an interval of 30 days.

The chart does not show a sufferer in August, but it is probable that someone suffered from the complaint during this month in a mild form, although all inquiries failed to discover the missing link between C and the next patient (D), who fell ill on Sept. 10.

A schoolboy (F), who fell ill on Oct. 11, lived near D and may have been infected by her, for they were known to have been in contact just before she fell ill.

A girl (E), aged 9, was probably also infected by D and in turn infected her mother (G), a boy (H) and a girl (I)—brother and sister—and her own elder sister (J).

A youth (K) at an isolated farm was undoubtedly infected by his brother (F) and in turn probably infected his little sister (M).

The patient L was a farm man employed by the father of H and I.

The earlier instances show clearly a monthly interval; but, as the victims become more numerous,

it is easy to understand what may be the mistake of those who consider the incubation period to be a matter of a few days. It might be argued that E infected F, and that G infected her daughter (J), but, the chart being taken as a whole, with B and C showing definitely the long incubation period, and with the youth K and the farm man L also showing clearly this fact, since their only possible source of infection was in their own homes—i.e., respectively from the school-children F, and H or I—the evidence suggests a lengthy period, for the apparent intervals are 29, 30, 23, 31, 24, 25, 26, 31, 24, 23 or 24, and 31 days. There is no instance to offer of infection from a short and only possible exposure, which alone gives absolute accuracy on an incubation period, but the evidence points to a period varying from 23 to 31 days.

The accompanying table based on the 1929–30 epidemic also supports this suggestion. The little outbreak took place in a family of young adults and among their friends. An incubation period of between 25–29 days is suggested.

Patient	Date of onset	Remarks
N ..	Aug. 16, 1929 ..	Young woman, infection not traced
O ..	Sept. 14, ,, ..	Brother and sister of N
P ..	,, 14, ,, ..	
Q ..	Oct. 11, ,, ..	Brother of N, O, and P
R ..	,, 12, ,, ..	Young woman, a great friend of the family
S ..	Nov. 7, ,, ..	Sister of N, O, P, and Q
T ..	,, 6, ,, ..	Little girl, inseparable from the family
U ..	Dec. 4, ,, ..	Fiancé of S
V ..	,, 2, ,, ..	Two-year-old sister of T
W ..	,, 29, ,, ..	Father of T and V

PERIOD OF INFECTIVITY

From its behaviour in families, there appears to be evidence of a relatively short period of infectivity in this disease. In the family epidemic (see table) N was the original sufferer, and O and P fell ill, as would be expected, a month later. It is surprising that Q and R were not stricken until another month had elapsed, and S and T a month after this, for it is known all were in contact with N when she fell ill. There could be no periodicity in the appearance of the disease as there generally seems to be, if patients were infectious for a long time.

Findlay, Dunlop, and Brown (1931) quote a good instance of this serial incidence:

A boy, aged 12, returned home for the holidays from his preparatory school, in which cases of jaundice had occurred, and at once went sick with a typical attack of catarrhal jaundice. Four weeks later his small sister, aged 8, developed the same disease; the father sickened thirty-one days after his daughter, the mother thirty days after her husband.

It is difficult to decide on a figure for this duration of infectivity, but I have proved infectivity on the fifth and seventh days of the disease and have been successful in acting on the assumption that a fortnight's isolation is sufficient. Dr. Ralph Bates (1936) holds a different view and considers that isolation should be carried out for a month; but the necessity for this is assumed from one incident only, and I respectfully suggest that it is not so easy to be sure of the infecting patient in an institution as it is in a country district.

There is also some evidence that the disease is infectious before the appearance of symptoms—i.e., in the later stages of the incubation period. This was suggested by Booth and Okell (1927–28) and later by Lisney (1937). The following appears to be a good instance of this:

A boy fell ill with measles on Oct. 18, 1929. He did not return to school after his convalescence and developed jaundice on Nov. 17, which suggests a minimal incubation period of 31 days. The only children from whom he could possibly have contracted jaundice did not fall ill until Oct. 25; hence they appear to have been infectious eight days before the development of symptoms.

DROPLET INFECTION

There is no evidence that the disease is transmitted by contamination of food or water, and the epidemics do not display the explosive character which would be associated with such contamination. The accompanying chart makes it apparently clear that personal contact is the only factor in the spread of the disease, and this is probably by droplet infection. Although there has been a complete absence of nasal catarrh or sore-throat in my experience, epidemics associated with sore-throat have been recorded by others, notably Frazer (1935) and Chomet (1934).

CONTROL OF INFECTION

Having reached certain definite points in the natural history of this disease, we are now in a position to discuss such control as is possible. In the first place we can tell the public that "jaundice" may be an infectious disease. Every patient with catarrhal jaundice should be isolated at the outset and for a reasonable period thereafter. It is a common experience that in the isolation of infectious patients it is as well not to make the conditions unnecessarily irksome. In measles a week's isolation is generally enough and will be cheerfully and loyally kept. In a very small percentage of instances infectivity may be prolonged after this, but isolation instructions must be practical and reasonable, and the difficulties are great for a mother with a family of youngsters recovered from all signs of disease and in boisterous health. A fortnight or even three weeks has been suggested as the duration of isolation in measles, which is not only impractical but unnecessary. Perfection will not be attained, especially if too high a standard is set. Having evidence that patients with catarrhal jaundice are not usually infectious for more than a fortnight, I have allowed children to return to school after this period, and there has been no spread of the disease from these children.

Assuming that we could isolate the first patient and then the contacts at the end of the suggested incubation period, the control of an epidemic would appear to be simple, but there are adverse factors which have deprived me of success. In the first place, the original sufferers have had the disease very mildly and, no medical attention having been requisitioned, isolation has not been carried out. It is those who are mildly affected and able to carry on their usual avocations that are mainly responsible for the spread. The disease is much commoner in children, and therefore it is to the school we must turn for help, and we must see that the school-teachers are alive to the infectious nature of the disease.

School closure as a preventive of the spread of epidemics is a vexed question. In an isolated country district there is a useful time to close a school in a measles epidemic, and that is for a short period beginning a week after the first sufferer has been discovered. The accompanying chart shows that school closure, represented by the summer holidays

(Aug. 8–Sept. 22), was a complete failure in epidemic jaundice.

The last point is a negative one. It is not necessary to control supplies of milk, food, or water. The weight of evidence is in favour of personal transference of the infection and against infection from contamination of milk, food, or water.

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GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM AN ONLOOKER

III

THE general practitioner may be dead, but he certainly doesn't lie down. Everyone agrees that much of his work will henceforward have to be done by teams or groups, in hospitals and clinics; but the British Medical Association still wants everybody to have a family doctor. Conservative opinion in the United States similarly resists the invasion of medicine by mass-production methods—the technique of the factory—and points out that on the neighbouring fronts of education, sociology, and penal reform these industrial ideas are already in retreat. After all, "it is always the individual patient who requires medical care, not diseases or economic classes."

Against this view that the management of the sick calls for a craftsman rather than an operative we must recognise that the tendency of scientific progress is towards substituting objective data for clinical impressions: in Hugh Cabot's words "mere age and experience, though of primary importance in fitting scientific data to the individual, can no longer be substituted for facts obtained through the application of scientific method." If one asks how often it is actually necessary or desirable to employ elaborate apparatus one gets very various replies. At the top of the scale of thought we have those who say that about 85 per cent. of illnesses and injuries can be dealt with efficiently by any able general practitioner with very simple equipment. At the bottom we have Cabot objecting to treatment without diagnosis, pointing out that if the general practitioner is to diagnose aright in 80 per cent. of cases he will need an accuracy well beyond that of most specialists, and claiming that there are very few conditions—whether of eye, ear, lung, bladder, or nervous system—that are not better investigated and treated from the first by an expert.

This argument of Cabot's is impressive; for it is often the "minor" lesion, such as the septic finger, that is really important and really difficult. Yet if we let the general practitioner disappear there is no doubt that genuinely minor complaints will set unnecessarily complex machinery in motion. It can be positively harmful to ensure that each possible source of a patient's pain is investigated by the appropriate specialist; not only is it expensive, but he will get wrong ideas in the process. There will always, therefore, be room for someone (whether he is called general practitioner, internist, advocatus diaboli, or prisoner's friend) whose business it is to preserve a sense of proportion. Many of us have reason to know the unwisdom of entrusting the sick to the mercies, however tender, of a group of specialists unless one of them is at heart a general practitioner and is able to act as such. Specialisation, it has been unkindly said, is a better guarantee that a man knows little outside his own subject than that he is really competent within it.

Another of the advantages claimed for the family doctor is that he knows the patient and his wife and family at home, and their neighbours, and their way of life; which is obviously much better than relying on a report from a social worker. Cabot, in the United States, thinks that the increasing mobility of the population has practically abolished this advantage: the practitioner's "possibilities of profound personal knowledge of heredity and environment have largely disappeared. The possibility of his being in touch with a whole family is substantially at an end." Even in this country the flat-dwelling public know better than to waste their time by going to an "ignorant G.P." But for my part I am still unconvinced that the family doctor is an anachronism. I still want somebody to save me from unsuitable or excessive specialist advice; I need someone to coördinate the findings of specialists and discount them if necessary; and above all I want someone who is willing to talk to me, at length, about my migraine, my little boy's delinquencies, my wife's recent strangeness, my baby's inoculation, and my daughter's desire to marry a man with asthma. Sir Farquhar Buzzard makes the right division in saying that while the saving of life has become the job of institutional teamwork, "the saving of health and the prevention of illness, in the long run of far greater interest to the welfare of the community, must be initiated by the general practitioner in the home." The fact that people are nowadays so much better informed about their bodies and about disease increases rather than diminishes the need for an interpreter. As medicine grows more difficult to the doctor it also grows more difficult to the patient.

Borrowing a parallel from theology, it appears that if there were no such thing as a general practitioner it would be necessary to invent one.

* * *

It has been said that newspapers are edited for other editors; and it is only too easy to practise (or organise) medicine for other doctors—to be satisfied with pleasing or astonishing one's colleagues instead of providing what the public really wants. "We are slowly developing a society in which old age with its degenerative conditions will represent a constantly increasing percentage of disease." Surely then we should be thinking about giving the kind of continuous friendly care that old people ask, and not

exclusively about means of applying scientific medicine?

* * *

In making a list of the patient's requirements J. N. Glaister put first: "to be attended by a doctor he knows and trusts." Too often at present he is attended by a doctor he knows but does not trust; while the exponents of group medicine offer him a doctor whom he can trust but does not know. Progress might come either by making the practitioner more trustworthy or by making the group more intimate in its contact with the patient's life.

To make the practitioner more trustworthy the first essential is to bring him into close and everyday coöperation with a specialist group at a hospital or at least a clinic. If, as the Dawson report put it, individualist medicine is only to be practised with the "limited opportunities attached to the crowded surgery and the patient's home," it cannot justifiably be practised at all.

It is essential that the coöperation should be really close and not merely administrative; for if the practitioner is to transfer his patients to a specialist for every minor ailment, and then forget about them, he will soon lose all knowledge of medicine and become (as is often remarked) a mere shopwalker. The ideal safeguard against this would be for him to make his own examinations wherever possible and then go with each patient to the specialist to discuss the case; the shopwalker must attend in each department and help the customer choose the goods, for only thus will he learn more about the business than those who serve behind the counters.

This plan fits in with the recommendation in the Dawson report that the practitioner should sometimes have his surgery at the local health centre or hospital, spending part of his time there and part in visiting his patients. When he does so he will look remarkably like the Russian district doctor working from a Russian polyclinic under a state medical service. But there will still be a fundamental distinction between the Englishman and the Russian, in that the former is directly responsible to the patient while the latter is merely the motile member of a group and is responsible to his superiors and employers. Under the Russian system—and in most plans for state medical services—the district doctor is a junior and rather insignificant person, who is certainly not in a position to defend his patient from specialists; whereas (in theory at least) the English general practitioner is the patient's own doctor, and his contract, status, and knowledge should enable him to control the work of experts.

To put it another way, the general practitioner can either be the least important or the most important person in medicine. His position, one way or the other, depends on our choice between two different conceptions of the doctor-patient relationship: A person must either be the patient of an individual doctor, who delivers him up to a group when necessary but retains his sense of responsibility and his right to comment, complain and even correlate; or else he is ab initio the patient of a group (be it clinic, voluntary hospital or state medical service) whose members are only agents of that group and are not the patient's "own doctor," however much they may simulate him by domiciliary visiting and personal helpfulness.

We have to decide therefore between (1) practice by individuals associated with groups and (2) practice directly by groups, which may be of any size up to a national medical service. From the standpoint of technical efficiency the main advantages the individualist doctor should be able to offer are knowledge of heredity and environment, continuity of observation, and the sense of proportion generally lacking in specialists. Whether the service offered, either by group or individual, is fully satisfactory depends, however, not only on its efficiency but also on the patient's emotional relation with those who offer it. Apart altogether from technical advantage there may be psychological or biological reasons for preserving (or discontinuing) individualist practice.

* * *

Illness, as we all recognise, brings a reversion to childhood. The sick man has summoned the doctor to save him and to bear his burdens: having temporarily turned into a child, he demands a father. "At least seventy-five per cent. of all the illness of the world," a psycho-analyst claims, "can be helped only through the 'transference' situation to the doctor. Destroy that and you foster ills worse than those that exist."

The chief characteristics of the father, as I see him, are that he has supernatural powers (being able to extract watches from the wrong pocket), and that he is *your* father (having a special reason to help you). The medical "father" may seek to convey either or both of these impressions; but nowadays on the whole he makes far less effort than formerly to prove his personal powers over nature, and he concentrates instead on securing for his patient the benefits of the very real magic supplied by science. He knows that he cannot compete with a large hospital in the spells woven by prodigious apparatus, complicated procedures, and highly trained teams; so he has ceased to dress or behave as a magician. Today in fact there has been a partial division of the paternal function, and whereas the main qualification of the group to act as father is its power over disease and death ("if this hospital can't help me, nothing can"), the main qualification of the individual is his personal or professional dedication to the patient ("I can rely on Dr. Blank, who brought me into the world, to do his utmost").

The personal dedication is something no hospital or clinic can ever achieve, and if it is worth preserving we must preserve not only individualist practice but also, as far as possible, free choice of doctor. Much nonsense is talked on this subject, but the fact remains that if the patient is to give himself into the hands of one doctor, rather than a group, free choice (on both sides) is much to be desired. Attempts to create any useful father-and-son relation between patient and doctor are unlikely to succeed if they start, as they often must, with a feeling that "I can't bear that man to touch me"; nor is any very satisfactory relation going to arise if the patient thinks his doctor an ass. On the positive side free choice forges a link between patient and doctor which strengthens confidence and heightens endeavour. It is an integral part of the ideal *personal* relation, at any rate in its early stages.

Not less significant than the personal dedication, however, is the professional dedication, which should permit the new patient to look on his doctor as a father from the moment of their first meeting. A professional dedication is implied in the practitioner's acceptance of his task on the traditional terms; which enables the patient to say "He's a doctor, and having taken me on he won't let me down." The theory behind the tradition is that the doctor agrees to put his patient's interest first, and one of the major therapeutic assets of the private practitioner should be his ability to give this assurance. A larger, impersonal,

body is not always in a position to do so; but I cannot help thinking that the larger units of medicine will do well to maintain this professional attitude wherever possible. Unlike the individual practitioner they cannot dedicate themselves personally to their patients; they cannot pretend to a special fatherly interest in one rather than another. But they can (like many of our voluntary hospitals) dedicate themselves professionally to the whole body of their patients, carrying on the medical tradition of whole-hearted loyalty to all that seek their aid.

To get the best help from a hospital or medical service, large or small, the patient must be sure that, besides being omnipotent, it is also well disposed—i.e., that it is working solely for his benefit and that of others like him. Could he always feel this, I wonder, if the service were provided by the state? Or if it were conducted for the purposes of science?

PUBLIC HEALTH

Regional Officers of the Ministry of Health

IN so far as it relates to the health services of local authorities the work of the medical staff of the Ministry of Health is to be partly regionalised. For this purpose England has been divided into five regions (see map), to each of which a principal regional medical officer, assisted by a small team of medical officers from the Ministry, has been appointed.

The regions and appointments are as follows:—

NORTH-EASTERN REGION

Counties: Durham, Northumberland and Yorkshire; with *headquarters* in Leeds.

Staff.—Principal regional medical officer: T. S. McIntosh, F.R.C.P.E. Medical officers: N. R. Beattie, M.D., E. Donaldson, O.B.E., M.D., and Miss D. M. Taylor, M.D.

MIDLAND REGION

Counties: Derby (less Peak district), Leicester, Lincoln, Northampton, Nottingham, Rutland, Hereford, Salop, Stafford, Warwick and Worcester; with *headquarters* in Birmingham.

Staff.—Principal regional medical officer: C. T. Maitland, F.R.C.P. Medical officers: Miss G. I. Brodie, M.B., G. C. Kelly, M.D., and G. E. Godber, M.R.C.P.

SOUTH-EASTERN REGION

Counties: Bedford, Cambridge, Essex, Herts, Huntingdon, Kent, Norfolk, Suffolk and Sussex; and the metropolitan police district. *Headquarters* in London.

Staff.—Principal regional medical officer: Sir Weldon Dalrymple-Champneys, Bt., F.R.C.P. Medical officers: N. F. Smith, M.D., E. T. Conybeare, F.R.C.P., W. S. McR. Craig, F.R.C.P.E., and A. L. Banks, M.R.C.P.

SOUTH-WESTERN REGION

Counties: Berkshire, Buckingham, Dorset, Hampshire, Oxford, Surrey (less portion in metropolitan police district), Devon, Cornwall, Gloucester, Somerset and Wiltshire; and the Isle of Wight and Isles of Scilly. *Headquarters* in Reading.

Staff.—Principal regional medical officer: F. R. Seymour, M.D. Medical officers: D. J. Williamson, M.D., Miss C. Sims, M.B., and W. D. T. Brunyate, D.M.

NORTH-WESTERN REGION

Counties: Chester, Cumberland, Derby (Peak district), Lancaster and Westmorland; with *headquarters* in Manchester.

Staff.—Principal regional medical officer: A. E. Quine, F.R.C.S. Medical officers: F. N. Marshall, M.D., H. A. Raeburn, M.R.C.P.E., and J. C. Winteler, M.R.C.P.

The new arrangement, it is stated, involves no substantial change in the duties that the medical officers of the department at present perform or in their relations with local authorities. It is believed, however, that the existence of regional staff having greater familiarity with local circumstances and problems will be of great assistance to the department, and it is hoped that local authorities and their officers will find it convenient to be able to refer to the principal medical officers any questions on which the advice or assistance of the Ministry may be desired. Further, this regional scheme is described as an essential element in the preparations the Ministry is making for the provision of medical services in case of war.

The scheme does not make any major change in the work of senior medical officers of the Ministry who are responsible for special services—e.g., maternity and child welfare and tuberculosis—though it is hoped that they will be relieved of a certain amount of routine work. Their services will be available in a consultative capacity to the regional staffs, and also, as in the past, to local authorities and their officers. The regional staffs have been so selected as to make possible some degree of specialisation among their personnel.

The new arrangements cannot at once be brought into full operation, but since April 1 medical questions relating to a particular locality have been referred to the principal regional medical officer concerned. The regional officers will endeavour to make contact as soon as possible with the medical officers of health of their areas.

First-aid Posts in London

The Ministry of Health announces that the proposed location of first-aid posts in 18 of the London boroughs and in the City has now been approved, either officially or provisionally. Eventually the county will have over 200 aid posts, excluding those established by the Port of London authority in the dock area. More than half of the posts already approved will be in hospitals, clinics or health centres and could be ready to function at very short notice. Mostly accommodation for the posts can be found in existing buildings, but in a few areas a new building will have to be erected. Posts of the Nissen-hut type are to be put up at Battersea and Hackney. Three of these huts together form a unit, one for cleansing and two for first-aid. Though the possibility that streets might be blocked makes it impracticable to rely mainly on the mobile units, at least one will be available in each borough to supplement or reinforce the fixed aid posts.

Of the 10 posts to be established in Westminster 1 is to be in the new Westminster Hospital, 1 in the basement of Adelphi House (to serve Charing Cross Hospital), 1 in the basement of Kingston House South, Ennismore Gardens (to serve St. George's Hospital), and 2 more in basements in Dolphin Square and Berkeley Square; 2 smaller posts will be located in hospitals in St. Vincent Square and Soho Square and 3 in other hospitals in sites not yet determined.

Anglers and Typhoid

After the Croydon outbreak of typhoid the Ministry of Health suggested in a circular letter to local authorities that all possible sources of contamination should be removed from public reservoirs. Acting on this advice the Doncaster corporation banned anglers from fishing at Thrybergh reservoir, a popular resort for that pastime; but later the Doncaster Angling Association which has 2000 members offered that each angler should produce a medical certificate to say that he was not a typhoid carrier, and it was decided that those who had previously held season-tickets should be allowed to continue fishing in the reservoir.

Stretcher-carrying Fitments for Ambulances

A design prepared as a guide to the construction of an all-metal fitment to carry stretchers has been prepared by the Ministry of Health and is described and illustrated diagrammatically in circular 1794 (H.M. Stationery Office, 2*d*.) which has been issued to local authorities. The fitment will enable small commercial vehicles to be converted into ambulances in an emergency. Each unit is designed to carry 2 stretchers, and vehicles large enough can be fitted with 2 units with a narrow gangway between. The dimensions of the vehicles and the necessary door space are set out and attention is drawn to the desirability of a good lock for easy turning, of a low tyre pressure, and of a plug for a portable electric inspection lamp. Local authorities are asked to arrange at once for the manufacture of enough units to equip the contemplated number of vehicles, with a reserve of 5 per cent. The fitments can be readily and inexpensively made, and quickly assembled, when necessary, without technical skill: and the unassembled parts form a bundle of small compass for storage in peace-time. The Minister suggests that volunteer ambulance drivers and attendants should be given practice, as part of their training, in the simple operation of assembling the fitments.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 1, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1675; diphtheria, 922; enteric fever, 12 (19 "expected"); pneumonia (primary or influenzal), 1175; puerperal pyrexia, 157; cerebro-spinal fever, 38; acute poliomyelitis, 2; encephalitis lethargica, 2; dysentery, 32; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 7 was 3268, which included: Scarlet fever, 657; diphtheria, 652 (carriers, 35); measles, 5; whooping-cough, 944; puerperal fever, 19 mothers (plus 11 babies); encephalitis lethargica, 302; poliomyelitis, 2. At St. Margaret's Hospital there were 23 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox or from enteric fever, 5 (0) from measles, 1 (0) from scarlet fever, 16 (3) from whooping-cough, 22 (2) from diphtheria, 50 (14) from diarrhœa and enteritis under two years, and 153 (32) from influenza. The figures in parentheses are those for London itself.

Birmingham reported 12 deaths from influenza; Portsmouth, South Shields, and Cardiff each 5; no other great town more than 4. Deaths from diphtheria were scattered over 19 great towns.

The number of stillbirths notified during the week was 266 (corresponding to a rate of 43 per 1000 total births), including 43 in London.

THE LANCET 100 YEARS AGO

April 13, 1839, *p.* 119.

From an article on John Hunter by Thomas J. Pettigrew.

As a lecturer Hunter's manner was bad, his language embarrassed, and altogether inelegant; he scarcely raised his eyes from his book, and he much fatigued his class, which was never a numerous one,—not exceeding thirty. He had no command over his temper, yet he was not wanting in sensibility or benevolence of heart. His speech was rude, and he habituated himself to the disgusting practice of swearing, which, in his day, however, was not of uncommon occurrence. He was of temperate habits, particularly during the latter part of life, in which he drank no wine. This was, probably, necessary from attacks of gout to which he was liable. As an operator, he has been variously described. In the performance of these painful parts of a surgeon's duty he appears to have been "slow and sure." His knowledge of anatomy would necessarily give security in these undertakings. His personal appearance has been thus described:—

"He was about the middle stature, of a vigorous and robust frame, and free from corpulency; his shoulders were high, and his neck short. His features were rather large, and strongly marked; his eyebrow projecting, his eyes of a light colour his cheeks high, and his mouth somewhat under-hung. In dress he was plain and gentlemanlike; and his hair, which in youth was of a reddish-yellow, and in his latter years white, he wore curled behind."

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

IF times were normal the subject uppermost in the minds of M.P.s at this time would be the Budget which Sir John Simon, the Chancellor of the Exchequer, opens on April 25. But whatever surprises the Budget reveals—and it does not seem likely it will be anything particularly astonishing—the daily surprises of foreign politics eclipse everything else.

Last week the House discussed foreign affairs on Monday with special reference to the threat against Poland and other major powers, and the occasion was remarkable for the unity of purpose shown in the speeches. It seems now that the peace negotiations of 1918 inaugurated not a period of peace but a period of armistice. The chief European and world question is whether we can get peace without passing through another world war. Is a peace of agreement still possible or will peace when it comes at last be that which is imposed by the machine-gun and the aeroplane bomb? It is clear that all parties in the House of Commons want peace: discussion only arises on questions of the possibility of concessions in its interest.

The present condition of Europe should be regarded, I think, not as a condition of peace but as a new kind of war. Propaganda by newspaper, by book and pamphlet, by lecture and above all by wireless, is perhaps the most important weapon in this war: it is this propaganda of cleverly falsified accounts of minor "incidents," plus large-scale lying about policy, which is the real "aggression." After the propaganda has upset national morale then comes the threat of the use of overwhelming force unless demands based on the propaganda are conceded. In Albania, a small country incapable of much resistance, the stage of propaganda was reduced to vestigial proportions, and actual force was used at once.

This supersession of all usual diplomatic and official discussions between nations is only not universally recognised as war because its killings are few in actual conflict, though possibly many in concentration camps and other prisons. The time has come when it would be simpler and wiser to consider diplomatic relations as of secondary account in Europe and to regard the moves made as attempts to take up positions of advantage from the standpoint of future hostilities. Unfortunately Germany and Italy may really disbelieve in the sincere desire of the democratic powers and Russia to keep the peace and settle disputes by agreement. So that Britain's alliance with Poland may be interpreted by the Axis powers as a threat of war instead of (what it is) an effort to secure peace.

* * *

On Tuesday and Wednesday last week the House discussed the Civil Defence Bill, and the financial resolution which provides the money necessary, and passed the second reading. There was unusual expedition in dealing with a long, very complicated bill covering nearly every aspect of civil defence, from the compulsory "designation" of private property for A.R.P. purposes to compensation for injured A.R.P. workers. And again a united House—plenty of criticism on detail and in policy, but none on the fundamental necessity of getting the job done. There is no doubt that on the major issues of foreign policies and defence Britain is now united.

FROM THE PRESS GALLERY

Civil Defence Bill

IN the House of Commons on April 4 Sir JOHN ANDERSON, Lord Privy Seal, moved the second reading of the Civil Defence Bill. Part VII referred to the obligations which rested on the Minister of Health in regard to the organisation of facilities for the hospital treatment of casualties, organisation for the training of nurses and the provision of bacteriological services. The bill would impose on the taxpayer a liability of something over £25,000,000, in addition to a recurring charge of £120,000 a year for 40 years. The sum of £25,000,000 was in addition to the cost of providing materials for which power already existed under the act of 1937. The expenditure in regard to the distribution of steel shelters and materials for strutting basements was estimated at another £20,000,000.

Mr. HERBERT MORRISON urged that the bill would place heavy burdens on local authorities which many of them were not in a position to bear. Local authorities could properly and necessarily act as the agent of the state, but if war broke out the state must necessarily become financially and administratively responsible for these protective services. The Labour Party were getting increasingly worried about the complete absence of any comprehensive shelter policy.—Sir PERCY HARRIS said they could not divorce the problem of shelters from that of evacuation. If there were adequate shelters the dangers of panic and of people leaving their occupations with the coming of the first air attack would be enormously decreased; otherwise there was a real danger of mass flight.

Dr. HADEN GUEST pressed for further information as to the general line of evacuation policy. What categories of adults were to be evacuated and what was to be done about children and mothers of children below school age. As much should be spent on civil defence as on the fighting services. Adequately organised evacuation would conserve the child population and the people who were helpless, aged and sick, would avoid useless casualties, and would simplify the provision of adequate shelter protection. The first-line productive workers must be given protection, and so must those who had to live in the urban areas round about the dangerous targets.—Mr. R. C. MORRISON said that clause 41 of the bill gave power for the clearing out of patients from hospitals in the event of an emergency likely to lead to war. In September last some dreadful things happened in such clearances. Patients were bundled out of hospitals, many of them hardly able to walk. He hoped that if the hospitals were to be cleared in the expectation of being required for casualties patients who were seriously ill would not be sent home when not in a fit condition.

Mr. WEDDERBURN, under-secretary of state for Scotland, said that the bill would confer on the Department of Health for Scotland the same powers and responsibilities as were conferred on the Ministry of Health in England, the principal ones being arrangements for evacuating the civil population and for the treatment of casualties in hospital. A survey had been made of all the hospital resources for the whole country and also a great number of big hotels and schools which might be used as temporary hospitals. Altogether 500 hospitals, institutions and other buildings had been visited and inspected and the department's hospital officers had since been in regular contact with the medical officers of health and superintendents of hospitals about the problems which would arise in connexion with the integration of particular hospitals into the

general emergency scheme. Plans drawn up showed that in Scotland, when the delivery of the medical and surgical equipment had been completed, they would be able to find 12,000 beds for wounded persons in the first 24 hours of the war and another 8000 by the end of the first week. They were now engaged on plans for expanding the accommodation for the treatment of casualties and for another 6000 beds in hutted units adjoining existing institutions. The Scottish Central Emergency Committee for the Nursing Profession was appointed in January to compile a register of nursing personnel in Scotland and to make arrangements for their training. Local committees were being set up to organise the training of nursing auxiliaries and a register of trained or semi-trained nurses was being compiled by the College of Nursing. They had ascertained the full requirements in the way of medical or surgical or ward equipment of the hospitals in the scheme. All the hospitals had been asked to maintain reserves of stores, and they had also placed orders for a large quantity of drugs, dressings and surgical equipment the delivery of which he hoped would begin that week.

Colonel NATHAN said that while on paper the hospital scheme for dealing with casualties was good, his only doubt was as to how it would work if an emergency arose. A large number of the places scheduled for use as hospitals might not prove suitable; some of the existing hospital accommodation might very well form the nucleus of large extensions by the erection of hutments. In his view more money would be required for the necessary structural alterations to hospitals than was contemplated. The chief object was to get casualties, who would be only patched up, as fast as possible away to the country for proper treatment in order to make room for the next batch.

Sir FRANCIS FREMANTLE urged that the issue of identity discs by the local authorities should be made compulsory. Mobile first-aid posts and outfits would probably prove more useful than fixed ones, though a number of properly equipped first-aid posts would have to be provided. They should be in some kind of underground bomb- and splinter-proof shelter—not a deep shelter. He was informed that the total number of nurses now nursing in London would only be sufficient to staff one of the 13 sectors laid down for the defence of London. Fully trained and qualified nurses would have to be supplemented by women with an elementary training and he appealed to women to come forward now and get their training.

Mr. BURGIN, Minister of Transport, replying to the debate, said that arrangements had already been made for ambulance trains by the conversion of certain parcel vans, and that Green Line coaches had already been adapted for road transport of casualties.

When the debate was continued on the following day Mr. ELLIOT, Minister of Health, said that each local authority had now been informed of the number of persons allotted to its area on the basis of one person per room. Transport authorities would provide for the evacuation of the 3,000,000 persons in priority groups—a colossal task. They were arranging for a movement of 3,000,000 persons without interfering with the 1,000,000 people who had reserved accommodation in the reception areas under private arrangements. Mr. Elliot thought that the number of children would be from 2,000,000 to 2,500,000 and the balance would be adults. The persons making their own arrangements might all be adults. The House must consider the risks of over-planning. As for casualty accommodation, by using existing hospital beds and clearing others they could get 200,000 beds at once—beds which not only had pillows, bolsters and blankets but also nurses. The extra 100,000 beds which would be provided within a few days after war broke out were on order; 25,000 had already been received and distributed to the hospitals. If the others were not all delivered local requisitioning should help to provide that 100,000. The need for nurses was urgent; 80,000 were available, but three times that number might be required before the war was over. An emergency committee to establish a central register of nurses and nursing auxiliaries and a local organisation in every county and county borough under the charge of the medical officer of health was responsible for dealing with volunteers and training them. The central committee had already received some 4000 applications. Arrangements had been made for the erection of auxiliary accommodation for 20,000 beds in the form of hutments in the London area, the Birmingham area and Tyneside. He hoped that full use might be made in peace-time of this additional reinforcement to the hospital accommodation of the country. Mr. Elliot did not regard the 20,000 additional beds in hutments as more than a start, but he would not like to hold out hopes of getting to a further stage at an early date. The bill was read a second time.

In the House of Commons on April 5 the Public Health (Coal Mine Refuse) (Scotland) Bill was read the third time.

QUESTION TIME

TUESDAY, APRIL 4

Anti-Gas Protection for Infants

Mr. POOLE asked the Lord Privy Seal up to what age was it intended the gas-bags for very young children should apply; how many of these had been issued to date; and when it was expected the issue would be completed.—Sir JOHN ANDERSON replied: This protective device is intended for babies under 2 years of age. Contracts for the manufacture of the various components have been placed but no issues have been made. I cannot say precisely when the issue will be completed.

Feeding of School-children in Scotland

Mr. MATHERS asked the Secretary of State for Scotland what number of Scottish school-children received free meals and free milk, respectively, in 1938, as compared with 1933; and what were the amounts expended by the local education authorities on these services in the two years mentioned.—Mr. COLVILLE, in reply, gave the following table of figures.

Year	Children who received—		Net cost to education authorities	
	Free meals	Free milk	Free meals	Free milk
	£		£	£
1933	26,220	—	19,458	—
1938	33,763	64,434	30,446	22,024

Notes.—(1) In 1933 there were no special schemes for the provision of milk in operation: where milk was provided it was classified under the heading of meals. (2) The number of children who received free meals or milk includes children who were provided for by voluntary agencies. (3) The net cost to education authorities represents the cost to the authorities after deducting receipts from parents, &c.: it does not include expenditure on apparatus, equipment, and service which education authorities may incur without regard to consideration of the necessity of the pupils.

Sanitation in Scottish Police Cells

Mr. CASSELLS asked the Secretary of State for Scotland if he is aware that the construction of police cells for untried prisoners in many Scottish areas was out of date in respect of lack of facilities for cleaning by hosing the floors after sickness of prisoners, defective illumination causing danger to prisoners under the influence of alcohol, a proper method of communication between the prisoner and the police officer in case of illness of the prisoner, and bad heating arrangements; and what steps he intended taking to remedy these defects.—Mr. COLVILLE replied: Police cells in Scotland are regularly examined by His Majesty's Inspector of Constabulary in the course of his normal duties; and it has been impressed on the police authorities who are responsible for their provision that all cells should have adequate lighting, heating and ventilation and be furnished with satisfactory sanitary accommodation either inside the cell or in proximity to it.

WEDNESDAY, APRIL 5

Malaria Research in Tanganyika

Dr. HADEN GUEST asked the Secretary of State for the Colonies whether his attention had been called to the report of Dr. D. B. Wilson, of the malaria unit, Mashi, Tanganyika; and whether, in view of its conclusion that immunity was obtained from malaria by exposure to infection in infancy, he would submit this report to the Medical Research Council for consideration and report. —Mr. M. MACDONALD replied: The answer to the first part of the question is in the affirmative. As regards the second part, a copy of the report was sent direct from Tanganyika to the Medical Research Council, and copies have also been sent to the Permanent Mandates Commission at Geneva. I arranged for the report to be considered by the Colonial Advisory Medical Committee, and they have made certain comments, which have been communicated to the Tanganyika government. In the circumstances I do not consider it necessary to submit the report formally to the Medical Research Council, as suggested by the hon. member.

Powers of the Welsh Board of Health

Mr. JAMES GRIFFITHS asked the Minister of Health whether, in view of the need for closer supervision of the work of local authorities in Wales, as recommended in the report of the Committee on Anti-Tuberculosis Services in Wales, he proposed to examine the constitution and powers of the Welsh Board of Health so as to invest it with the authority necessary adequately to fulfil its duties. —Mr. ELLIOT replied: The report of the Committee on Anti-Tuberculosis Services in Wales is now receiving consideration. The Welsh Board of Health has, in relation to transferred functions, the same powers in Wales as the Ministry of Health has in relation to similar functions in England. I do not think, therefore, that the Welsh Board lacks authority to fulfil its duties.

PANEL AND CONTRACT PRACTICE

Does the Family Doctor Exist?

THE *Birmingham Gazette* of March 29 reports a meeting of the Birmingham insurance committee held on the previous day, with Dr. J. J. Bekenn in the chair, to consider the British Medical Association's scheme for a general medical service for the nation. Mrs. C. H. Griggs, a lay member of the committee, while agreeing that the family doctor should be at the centre of all treatment, urged that the medical profession should first put its own house in order. Nowadays, she said, the general practitioner is not in fact a family doctor, and though there are isolated instances in which he attends grandfather, father and son, he has many patients whom he does not even know by sight. It was a calamity that public-health services were becoming increasingly separated from the private practitioner, but an outstanding difficulty in the way of depending on family doctors was the great variation in their service and efficiency. If antenatal care, for example, is to be provided by general practitioners they would have to offer a standard at least equal to that supplied by the public authorities. Replying to these comments, Dr. J. A. Brown said that the insurance service had improved enormously and its extension would mean earlier and therefore more beneficial treatment. Dr. F. A. L. Burges said that when people came to him and said, "I am not a panel patient," he replied, "I have no panel patients; my patients are all patients—private or panel."

Next day the chairman of the Birmingham panel committee and the secretary of the public medical service gave a statement to the *Gazette* saying that insurance practitioners almost always attend the whole family. "In certain areas, of shifting population, the position of the family doctor is not perhaps so well defined, but the great bulk of the population does not move about and, therefore, has a family doctor." With the free choice available under the Insurance Acts, they added, "no family is likely to continue to seek the services of a practitioner in whose skill it has not the fullest confidence."

Attention to Urgent Calls

An insurance practitioner was off duty on a Sunday, and in accordance with a standing arrangement his two partners deputised for him. During the afternoon an insured person suffered from an attack of hæmorrhage, for which treatment was given by another doctor living close by. He said further treatment would be required two hours later, and gave the patient's mother a letter for the responsible practitioner. This was given to the deputy practitioner's wife, but as no visit had been made by 8.30 P.M. (four and a half hours after the initial treatment) another doctor was called, and arranged for the man to be admitted to a hospital, where he remained for a month.

The case revolved around what happened when the letter was given to the wife of the deputy. The complainant's evidence was that the doctor was out, but that the messenger had said that the matter was urgent and was assured that the doctor would be asked to call as soon as he came in. The deputy's wife said that when the letter was brought at about 6.30 P.M. she asked what it was about, and was told "It is all in the letter." She obtained the name and address, which she wrote on the envelope, and thinking it contained an account placed it in the dispensary to be dealt with on the following morning. The result was that neither the responsible practitioner nor either of his deputies became aware of the call until the following morning, by which time the patient had been sent to hospital.

The medical service subcommittee formed the opinion that the message as delivered was sufficiently clear to show the need of a visit that evening, that the doctor's wife failed to give the attention that the message called for, and that this omission was responsible for the failure of either of the deputy doctors to visit the insured person. The insurance committee with one dissentient endorsed these opinions and decided that the respondent practitioner should be advised to see that greater care would be taken in the future.

Fortunately there was a delay of only about two hours in obtaining further treatment for this particular patient. But it is worth noting that a large proportion of the cases considered by medical service subcommittees arise out of a failure by the messenger to make clear, or by the doctor to appreciate, that the need for medical attention is really urgent. This sort of misunderstanding is mainly responsible for complaints about failures to visit insured persons.

A Voluntary Refund

An insured person's membership of an approved society was terminated in 1926 and his name was subsequently removed from the list of his doctor. In July, 1938, the Ministry of Health ascertained that membership of the society should have been

continued until 1929, when the man became 65 years of age, and that in consequence he should have been regarded as continuously insured. Between 1936 and 1938, before the establishment of continuous title to benefit, the insured person received treatment for which he paid fees amounting to £14 12*s*. The doctor, when told of the circumstances, called at the office of the insurance committee and on behalf of himself and of a partner who had joined him in July, 1937, offered to refund the sums paid in view of the fact that the patient had been throughout the course of the treatment an insured person entitled to benefit. The insurance committee reinstated the patient's name on the doctor's list as from the date of removal, and paid the doctor on the basis of the drug tariff a sum amounting to £3 10*s*., the value of the medicines supplied to the patient. The practitioner was thanked by the committee for his coöperation, and the insured person has written expressing appreciation of his generous attitude.

OBITUARY

RONALD SIMPSON PATERSON

M.D. MANC., D.M.R.E., F.F.R.

Dr. R. S. Paterson, senior radiologist to the Royal Infirmary, Manchester, died after a short illness on March 30, at the age of 45. He had used his energies freely and successfully in helping to raise the status of a young specialty and though he had spent all his working life in Manchester he had built up more than a local reputation.

Paterson was educated at King Edward School, Retford, and the University of Manchester, where he graduated in medicine in 1917. He acted as resident at the Royal Infirmary while still a student and soon after he obtained his degree joined the R.A.M.C., serving in France until the end of the war. Then he decided to specialise in radiology and took the Cambridge diploma in 1920, coming back to Manchester as registrar in the radiological department of the Royal Infirmary. His skill in technique, in interpretation, and in administration was soon apparent, and the successive migration of his seniors, Dr. J. M. Woodburn Morison and Dr. A. E. Barclay, led to his rapid promotion; he was made assistant honorary radiologist in 1924 and took charge of the department in 1928, at a time when the demands made on its services were rapidly increasing. He enjoyed organising its development; his keenness and enterprise were infectious and he got what he wanted without friction by enlisting the interest of his colleagues in his plans. Paterson had joined Woodburn Morison and Barclay in private radiological practice; when they left Manchester other partners were brought in and he was senior of a firm of three at the time of his death. He found time to take on many other jobs and did them with zest. He was lecturer in applied anatomy at his own university and examiner for the Universities of London and Liverpool and for the Society of Radiographers. He was an active member of the council of the British Institute of Radiology and served a term as president of the section of radiology of the Royal Society of Medicine. In 1934 Paterson was prominent among those who planned the establishment of an association of doctors specialising in medical radiology; the object was to advance the subject in all its branches, with particular reference to its clinical, ethical, educational, and economic aspects. The outcome of the movement was the formation of the British Association of Radiologists which held its first meeting in July, 1935, in Birmingham; Paterson became its second president. The recent amalgamation of this association with the Society of Radiotherapists of Great Britain and Ireland to form the Faculty of Radiologists, of which the fellowship is the highest qualification open to specialists in either branch, was a source of much satisfaction to him. A colleague testifies to his popularity, his gift for organisation, and the knowledge of affairs which enabled him to bring his department to a high state of efficiency; his opinion on matters of policy was greatly valued by the medical staff and board of management of the Royal Infirmary. His personal qualities of shrewd common sense, kindness and sympathy earned the loyalty of those who worked for him and the trust of his patients.

Dr. Paterson married in 1937 Miss Nancy Cross, who survives him. There are no children.

DENIS JOSEPH COLLINS

C.B., C.M.G., M.D. R.U.I.

Major-General Collins, who died at Sutton, Surrey, on April 1, served for 33 years with the R.A.M.C., and even after his retirement in 1926 maintained a great interest in his old service and remained an active member of the committees of several corps associations. He was a student at Queen's College, Cork, and the London Hospital, taking his M.B. in 1891 and his M.D. in 1910. He entered the army in 1893 and was gazetted captain three years later. Quite early in his career his special knowledge of hygiene was of value in dealing with outbreaks of plague in India, where he was stationed from 1896 to 1903; for this work he twice received the thanks of the government of India.

At the outbreak of the late war Collins was serving in Poona and he was given command of a general hospital in Iraq. There he showed great ability as an administrator and he received the C.M.G. in 1915 and was made a brevet colonel in 1916. He held administrative posts in India during the later part of the war, and after a period of service at home was appointed deputy director of medical services of the Southern Command in India, being promoted major-general. He remained in the Southern Command until his retirement, and during his term of office was instrumental in the inception and carrying out of valuable reforms. He received the C.B. in 1918. On leaving the active list Collins was appointed director of the county of London branch of the British Red Cross Society, and under his guidance the branch extended its activities and maintained a high standard of efficiency. He was made a deputy lieutenant for

the county of London in recognition of his services. His appointment in 1933 to be a colonel commandant of the R.A.M.C. was a source of much pleasure to him and to his friends.

Collins's pleasant manner, sense of humour, and sociability made him a most agreeable companion. He gained the affection of all who served with or under him, both officers and men, and although he was always considerate, he was a good disciplinarian. He had a high standard of duty, was not afraid of responsibility, and was seldom, if ever, at a loss when he had to deal quickly with some new situation. He was always a hard worker but never made the mistake of trying to do everything himself. His judgment was sound and his temper equable. His professional and administrative ability secured for him the confidence and esteem of the general officers on whose staff he served. He had not been in good health for some time and resigned the appointment of county director at the end of last year, but his death was due to a street accident. He leaves a daughter and one son, a major in the Indian Medical Service. His wife died in India soon after his appointment as D.D.M.S.

WILLIAM ERNEST HILLS
M.R.C.S.

Dr. Hills, who had been in practice at Hampstead for 35 years, died there on March 24. He was born in 1872, the son of Edward Hills of Dover, and was educated at Dover College. He was apprenticed to a dentist for a time but forsook dentistry, went to Guy's, and qualified as M.R.C.S. in 1896. After holding house-appointments at Guy's he went to India as plague medical officer to the Sholapur and Ahmednagar districts and from there to Cairo as resident surgical officer at Kasr-el-Aini. In Egypt he caught smallpox and had to return to England, where he practised in London in the Finchley Road and also acted as clinical assistant at Mount Vernon Hospital. After two years he moved to Church Row, Hampstead, and went into partnership with W. N. Evans. He combined general practice with anæsthetics, and was anæsthetist to the Prince of Wales Hospital, Tottenham, the London Temperance Hospital, and later to the King George Hospital at Ilford. In 1915 Hills went to France with the French Red Cross and he later served with the R.A.M.C. at Port Said and in France.

Dr. Hills was an active member of the Hampstead Medical Society, of which he had been president, and he was also a keen tennis and bridge player and a prominent freemason. He possessed a quiet dignity combined with a cheerful sympathy which endeared him to his patients, and the pains he took with his work meant that his opinions always commanded respect. He was unmarried.

FRANCIS HENRY MATURIN
M.B. CAMB.

Dr. Maturin, who died on April 4 at Lymington, after a short illness, was a general practitioner known far and wide through the New Forest area. Himself the son of a general practitioner of Hartley Wintney, in North Hampshire, he had many associations with Lymington through his grandfather, Canon Maturin, who was vicar of Lymington for more than fifty years. He was educated at Cambridge and at St. Bartholomew's Hospital, where he held several house-appointments, and he won renown both at football and cricket in his younger days; he was five times reserve for England at rugby and he scored a unique century on one occasion of 98 runs and twins. Senior partner of a large and widespread "firm," he yet found time to become lieut.-colonel of the 2/7th Hampshire Regiment, with whom (and later attached to the Royal Army Medical Corps) he spent the war years in India, where he commanded the largest Territorial hospital at Deolali. He was medical officer of health for Lymington urban district from 1920 to 1932 and was keenly interested in the hospitals in his area, contributing largely by his efforts to the development of that at Lymington from a small cottage hospital of 8 beds to a well-equipped modern hospital with six times that number. He leaves a widow, two sons and a daughter.

N. M. G. writes: "Passionately devoted to his work, his patients and his practice, Frank Maturin died as he and his friends would have wished—in harness. Leisure had come to mean nothing to him and he had probably taken less than a week's holiday a year for the last fifteen years: always the claims of some patient held him at home, and a day or two spent watching cricket seemed to give him energy for a year's crushing work. With no time and little inclination for reading, he had an uncanny faculty for keeping abreast of medical ideas, chiefly through contact with his younger colleagues, but his greatest strength was in his experience and retentive memory. The real tragedy is that all this experience and his many 'wise saws and modern instances'—above all on 'the management of the patient'—should be largely lost with him, as is too often the case with the great exponents of the art of general practice."

BERNARD RELTON
M.R.C.S.

By the death of Dr. Relton from influenzal pneumonia on March 6 at the age of 78 the profession has lost a fine example of the cultured general practitioner. Educated at Merchant Taylors' and grounded in the arts by his father, the Rev. E. W. Relton, vicar of Ealing, a distinguished Hebrew scholar, he entered St. Thomas's Hospital in 1879 with a science scholarship and became house-surgeon and assistant demonstrator in practical surgery. In 1885 he was drawn rather prematurely into practice by his wish to help a friend of his family in illness, J. H. Simpson of Rugby. Here he worked for the next 44 years with only one long leave of three months for a visit to his son in Lima. With an extensive midwifery experience before the days of state-registered midwife support, he had a remarkable record of apyrexia of which he was justly proud.

After the war Relton became senior partner in an amalgamated partnership of five, and at this time he was instrumental with his partner C. R. Hoskyn, and with A. I. Simey and others, in founding the Rugby and District Medical Society, of which he was the first president. An untiring worker and unsparing of himself in the interests of his patients and his fellow practitioners, he became in later years the friend and counsellor of many of the latter outside the circle of his own partnership. All sports appealed to him. He was a keen cricketer and an enthusiastic fisherman. He had captained his school, his hospital and his old school club at rugby football, and has always taken a keen interest in the Rugby Football Club of which he had been president for nearly 40 years. An omnivorous student of history, biography, and travel, and blessed with a remarkably good memory and critical ability, he was a sound and kindly judge of men past and present. He was gifted with a most attractive, warm-hearted, and very

human nature and his aim was always to promote good fellowship among his colleagues. Few men have formed a larger circle of real friends.

Dr. Relton's wife died in 1930, just before he retired, and he leaves one son.

ERNEST HANBURY HANKIN
SC.D. CAMB.

THE death at his home near Brighton of Dr. E. H. Hankin recalls a career that embraced many activities besides that of bacteriology, which was perhaps the most notable of them. Hankin was born in 1865, went to St. John's College, Cambridge, from the Merchant Taylors' school, and was elected a fellow of his college at an early age. His interest in bacteriological research led him abroad, to work in Robert Koch's laboratory and at the Pasteur Institute; and later instead of settling down in this country he accepted the post of chemical analyst and bacteriologist to the United and Central Provinces of India, with laboratories at Agra. His early years there were spent largely in combating cholera, at a time when the public-health authorities in India had still to be convinced that it was caused by a micro-organism. He was the first to advocate the use of permanganate of potash for disinfecting wells, and this was used extensively until the introduction of chlorination. Amongst his many original contributions to bacteriology and toxicology was one, little understood at the time, which clearly presaged the discovery of bacteriophage. The agent whose activities he studied had the power of rapidly destroying cholera vibrios and other bacteria in Ganges water. He realised it was an unknown agent but he did not give it a name, and his research was forgotten until the Twort-d'Herelle phenomenon was elucidated nearly thirty years later. Hankin collaborated with Haffkine in work on cholera and on plague. His other pursuits included the study of Mohammedan scroll architecture and the problems of flight, which he approached from the aspect of higher mathematics and also by field observations. He was often to be seen before dawn near the Agra abbatoir studying the wind movements and air currents set up at sunrise, as shown by the soaring flight of vultures and kites. His laboratory at this time was crowded with wings of birds in various stages of decomposition in beakers and jars. He was somewhat of a recluse and did not mix much with his fellow-men. His investigations absorbed him to the exclusion of the trivialities of Indian station life. In his retirement his interest in India and in various scientific problems seemed as keen and vivid as ever; nor did age wither his unusual mental vigour and ability. He died on March 29 at the age of 74.

WILLIAM HOWEL EVANS
M.D., B.SC. LPOOL

Dr. W. Howel Evans, honorary clinical pathologist to the Liverpool Royal Infirmary and honorary lecturer in clinical pathology in the university, died on April 6 at the age of 47. He had long been in poor health but he worked as long as he was able.

Howel Evans had an early scientific training which was of great benefit to him. Before he took a B.Sc. in 1913 he worked with Benjamin Moore on polyneuritis in pigeons, attempting to isolate the substance (now known as vitamin B_1) which cures this disease. He then decided to study medicine, aiming at clinical work. His course was interrupted by the late war, when he served as a surgeon probationer in the navy. He qualified in 1920 and became senior medical tutor and registrar to the Royal Infirmary, Liverpool. But his increasing deafness, later with vertigo, made it unwise to attempt practice as a physician and Howel Evans returned to laboratory work as Holt fellow and lecturer in pathology in the university; later he was appointed assistant pathologist to the Royal Infirmary. His main interest was in hæmatology, especially the relation of blood-platelets to the hæmorrhagic diseases and to pathological thrombosis, and he was recognised as an authority on this subject. He made a comprehensive study of the platelets in splenic anæmia after splenectomy, which formed the subject of his M.D. thesis in 1929. He differentiated two types of splenic anæmia, in one of which thrombocytopenia is associated with a general hæmorrhagic tendency. In these patients splenectomy could be undertaken with relative safety, but in those whose platelet-count was normal or higher than normal there was considerable risk of gross and persistent increase of platelets after operation and of a thrombosis which might prove fatal. Dr. Howel Evans contributed a chapter on the spleen and the blood-platelets to Maingot's "Post-Graduate Surgery." He was interested in other aspects of hæmatology, especially the leukæmias, and his special knowledge of blood diseases was much valued by his clinical colleagues, who sought his opinion freely and appreciated the firm decisive way in which it was usually expressed. The success of the blood-transfusion service of Merseyside was largely due to his organisation and reliable grouping.

He acted as secretary of the committee appointed in 1926 by the Medical Research Council and the Pathological Society of Great Britain and Ireland for the investigation of "status lymphaticus" and for the collection of information on a large scale on the weights and measurements of the thymus gland. He collected for analysis 700 record cards, and it was not until 1931 that the laborious pathological and statistical investigations were completed, the committee reaching the conclusion that the so-called status thymicolymphaticus has no existence as a pathological entity.

Though absorbed in his work Howel Evans had many other interests. Mr. Robert Kennon writes that "to the prostatic and diabetic he gave such personal attention that the light in his laboratory was to be seen far too often in the early hours of the morning. Despite his neglect of holidays he had played his part in sport: he was a county hockey-player, a member of the Lancashire team on southern tour in 1922, a rugger player and a keen follower of cricket—he was missing from his laboratory to watch with his son every stroke in the last exciting test match against Australia. He was a collector of antiques, full of lore on the art of making and faking furniture, a philatelist of high order, a collector of books and a voluminous reader."

He leaves a wife and two children.

". . . Everyone's imagination is shocked by the thought of a great modern city pounded to a heap of smoking ashes; it is not so easy, in a bustling cheerful town, with cinemas filled to overflowing, and shops exhibiting merchandise gathered from the four corners of the earth, to realise that the country is faced with grave problems of malnutrition, problems the solution of which demands as close co-operation, as much teamwork, and as high and devoted enthusiasm as ever were brought to bear on a war-time problem."—*Nature*, April 8, 1939, p. 575.

LETTERS TO THE EDITOR

BARCELONA BLOOD-TRANSFUSION SERVICE

SIR,—I had the privilege of knowing Dr. Duran Jorda and his institute and colleagues in Spain, as I also knew the institutes and their staff in Valencia and Madrid. In commenting on his article in your issue of April 1, I should like first to offer a tribute to the excellent and life-saving work done by the Barcelona Blood Transfusion Institute.

In my opinion, colorimetric signs of infection of stored blood will indicate only heavy growths. But infections not great enough to cause this brown colour (which colour was seen all too frequently in the blood supplied for the Ebro offensive) will yet cause an unpleasant rigor in the recipient. I do not doubt that most of the blood supplied from Barcelona, at least in the summer months, had some slight initial infection which, owing to unsatisfactory refrigeration, increased, and caused the rigors observed in about half the cases transfused by me and my associates in August, 1937 and 1938. The origin of this infection was possibly twofold: (1) from a bacteræmia of the donors, for bacterial dysentery is epidemic in Spain in the summer months; and (2) from some error of sterile technique that is likely to creep into collection, mixing, and storage when rather complicated apparatus is used.

Incidentally the apparatus shown in the picture was not actually the one employed during the war—at least up to the end of August, 1938, when I left the country. It may not, then, have had any extensive clinical trial. Although admiring its ingenuity I feel bound to point out its disadvantages:

(1) A tube in stored blood increases the tendency to clotting (see Elliott, Macfarlane and Vaughan, *Lancet*, Feb. 18, p. 384). Such clots occurring in this type of apparatus are disastrous, and they even occurred occasionally in the plain ampoules actually used in the war. The only way out of the impasse resulting from the subsequent blocking of the flow of blood is to break the apparatus, pour out the blood into another receptacle, and deliver by a two-way syringe or some other apparatus—a procedure I have had to follow on more than one occasion.

(2) Cleaning such an apparatus would be very difficult.

(3) The blood cannot be transfused while the apparatus is still in a water bath as it should be for quick transfusion—i.e., more than about 50 c.cm. per minute.

(4) Sealing the apparatus under pressure would need a special machine and technique. Moreover, if it is not well sealed either the seal breaks prematurely or is so hard to break that the force used drives the broken glass through the rubber tube with disastrous result. I and others have experienced both misfortunes.

Finally I would point out that for the ideal apparatus there are more than the three essentials mentioned by Duran Jorda—there are at least a dozen more. However we should be grateful for the way in which the Spanish Republicans have placed the fruits of their hard-won experience at our disposal.

I am, Sir, yours faithfully,

Reading, Berks, April 7. R. S. SAXTON.

PERNICIOUS ANÆMIA AT 83

SIR,—The following case of pernicious anæmia in a woman aged 83 seems worth recording:—

Oct. 25, 1938.—Patient obviously in a state of extreme anæmia. R.B.C. 1,220,000, well stained, average size large, some nucleated; Hb. 25 per cent.; C.I. 1·0.

For the next week the patient was in a state of extreme prostration, having almost continuous oxygen. Intensive liver treatment, chiefly by mouth, was started at once. Only one injection of 4 c.cm. Campolon was given at the outset.

Nov. 7.—R.B.C. 2,350,000; still some nucleated cells; Hb. 48 per cent.; C.I. 1·05.

Nov. 22.—R.B.C. 3,130,000; still some nucleated cells; Hb. 55 per cent., C.I. 0·9.

Dec. 6.—R.B.C. 4,240,000; no nucleated cells, cells rather pale; Hb. 75 per cent.; C.I. 0·89. Iron administration was begun.

Dec. 21.—R.B.C. 4,820,000. Hb. 82 per cent.; C.I. 0·85.

The patient has made steady improvement, and now seems in normal good health, having liver three times a week. I am indebted to Dr. T. C. Stone of Margate for the examinations of the blood.

I am, Sir, yours faithfully,

Broadstairs, April 4. MARTIN O. RAVEN.

LOW SPINAL ANÆSTHESIA FOR PERINEAL OPERATIONS

SIR,—It was with interest that I read a report on the use of low spinal anæsthesia in obstetrics by Mr. Todd and Dr. Burton in THE LANCET of April 8 (p. 825). For I have employed a similar method for some time past, Stovaine 0·25 c.cm. (M. & B. Chaput formula, sp. gr. 1·080) being used instead of heavy Percaine. The injection is made between the third and fourth lumbar vertebræ with the patient sitting up. This method was first introduced to me by Mr. Garth Stoneham of the Park Hospital, Manchester, but whereas he allowed his patients to sit up for 10 minutes, I have reduced this time to 7 with equally good results.

I have only used this method in the repair of perineums and not during labour, for it is exceedingly difficult to judge the right time for administration in labour. For the perineal operations I have found it ideal. The patient is conscious throughout and can move her legs. This can be of great assistance as the patient can hold her own legs in the lithotomy position, where no stirrups are available.

There is no postoperative vomiting and the only complications have been isolated cases of fainting, whose origin I think has been psychological rather than toxic. The blood-pressure falls at most 5 mm. of mercury. Persistent headache has also been noted on rare occasions and has in all cases responded to either Pituitrin 0·5 c.cm. or 5 oz. of ten times normal saline intravenously.

I am, Sir, yours faithfully,

DERYCKE P. HARRIS,
Resident Obstetrician, St. Mary's Hospital,
April 10. Milton, Portsmouth.

A QUESTIONNAIRE TO MEDICAL WOMEN

SIR,—May we call the attention of medical women to the questionnaire on the kinds of work being undertaken by them which has recently been circulated by the Medical Women's Federation to all women on the British medical register? A similar questionnaire on a much smaller scale was sent out ten years ago, but this is now quite out of date and useless for reference. Inquiries are frequently received regarding the number of women employed in various branches of medical work, the number married or retired from practice, &c., and to obtain any kind of accurate knowledge it is necessary that replies should be received from as large a proportion of medical women

as possible. May we appeal to any who have not yet completed the form to do so at once and to send it to the Medical Women's Federation, 9, Clifford Street, Bond Street, W.1. Extra copies of the questionnaire, if required, will be sent on application.

I am, Sir, yours faithfully,

VIOLET KELYNACK,
Medical Secretary, Medical Women's Federation.

April 5.

ANÆSTHESIA IN WAR-TIME

SIR,—In your last issue Dr. Ronald Jarman calls attention to the need for the organisation of efficient anæsthetic services in war-time, but he does not mention the provision of analgesia for painful dressings or the first-aid treatment of wounds. I think it is essential that all first-aid workers and all nurses who are likely to take charge of the dressing of war wounds should be fully acquainted with the use of gas-and-air analgesia, and machines should be provided for all first-aid stations and for all surgical wards.

I am, Sir, yours faithfully,

Station Road, New Barnet, April 8. JOHN ELAM.

LIFE-STORY OF SIMPLE HERPES

SIR,—The leading article in your issue of March 18 led me to refer to a note I made from either an article or a reference to such by O. Naegeli, of Berne, in the *Münchener Medizinische Wochenschrift* of Feb. 28, 1936. In this communication, according to my note, the following points are dealt with:—

(1) The belief of experienced practitioners concerning the favourable influence of herpes simplex upon other diseases, especially pneumonia. The mortality of pneumonia with herpes simplex is decidedly less than that of this disease without.

(2) The success of fever therapy in neurolues is most frequent and most pronounced in herpetics, especially in patients in whom a considerable herpetic eruption appears during the cure. In certain cases neurolues was favourably influenced by herpes-inoculation and subsequent actuation with fever, when a previous fever cure had been ineffective.

(3) Herpetics exhibit neuro- and liquor-lues more rarely than do non-herpetics. (I regret that this point was not dealt with more fully in my note whilst still the journal cited was in my possession. I have, however, given the reference should any of your readers be interested.)

As to point 1, I find the following on p. 138, vol. ii, of the second edition of that scholarly work, Fagge's "Principles and Practice of Medicine," edited and completed by Dr. P. H. Pye-Smith (1888).

"An eruption of herpes . . . is said to occur in from two-fifths to one-half of all cases of pneumonia; and what is very strange is that it is far more common in cases that do well than in those that end fatally. This has long been a traditional opinion, and it seems to have been established by the observations of Geissler, who found (Archiv d. Heilkunde, 1861) that out of 421 cases the mortality of those in which there was no herpes was at the rate of 29·3 per cent., whereas among those with herpes it was only at that of 9·3 per cent."

The information conveyed in your leader as to the widespread existence of herpetic antibody in human sera, as to carriers of the virus, and as to attribution, in carriers, of the attack of herpes occurring in infectious and other diseases to "upset of the balance between host and virus," is of interest. As regards traditional belief in the favourable influence of herpes simplex upon other diseases, especially perhaps pneumonia, my experience has not been with disease in general, and I should like to know what present experienced practitioners have to say on this point. In any case it seems justifiable to believe that herpes virus does exercise a favourable influence. Even more interesting, I think, than evidence of the existence of antigen would be experimental data as to the modus operandi of the virus in bringing about the results observed. Those engaged in bacteriology and immunology may be able to refer to work done on the subject. It would be strange had no work been done by way of explaining through laboratory research so long-standing a clinical observation. How, for instance, do antibodies of herpes virus and of pneumococcus interact?

As regards point 2 above it would be of interest to hear the experience of neurologists and psychiatrists. With what frequency does herpes simplex occur during fever therapy in neurolues? Speaking from memory after treating many general paralytics with various forms of fever therapy (incidentally, it is not proven, that I am aware of, that malarial therapy cures by fever), I do not recollect that herpes was at all common. Then, the statements of point 2 require confirmation. Especially interesting would be the experience of those—probably still few in this country—who are in a position to produce hyperpyrexia by what I believe is known as short-wave therapy. Whatever the influence may be of pneumonia, malaria, protein shock, &c., in "activating" herpes virus in carriers it does not follow that hyperpyrexia produced as above has the same power.

I am, Sir, yours faithfully,

Hove, April 11. EDWIN GOODALL

ILLNESS IN SMALLPOX CONTACTS

SIR,—May I suggest that it would add to the interest of Dr. Conybeare's account of the illness occurring in smallpox contacts, which appeared in your last issue, if exact details of the method of vaccination were given?

I am, Sir, yours faithfully,

Devonshire Place, W.1, April 10. CHARLES R. BOX.

BRITISH EMPIRE CANCER CAMPAIGN

AT a meeting of the grand council of this campaign, held in London on April 3, a grant of £1000 was made to the north of England branch for the continuation of the special short-wave investigations being carried out under the direction of Mr. F. Dickens, D.Sc., and a grant of £160 to Mr. E. Nevill Willmer, working at the University of Cambridge. The grants for the year now amount to over £40,000. The council received a report on the joint discussions held between representatives of the campaign, the Medical Research Council, and the National Radium Commission concerning the installation of a cyclotron in this country. The three bodies have agreed to refer this matter for further consideration to the radiology committee. It was stated that over 1200 free educational lectures on cancer have now been given in 21 counties of England and 8 of South Wales. A grant of £1513 was voted for the continuation of this scheme of national propaganda and for its extension to the counties of Derbyshire, Herefordshire, Leicestershire, Lincolnshire, Westmorland, Worcestershire, Warwickshire, Shropshire and Staffordshire. The council approved of a further sum of approximately £6500 being allocated to meet the expenses of the second year's working of the scheme of the clinical cancer research committee. This scheme covers an inquiry into all fresh cases of cancer in the London area. Dr. J. M. Woodburn Morison was invited to become the representative of the campaign on the scientific advisory committee of the newly amalgamated Radium Institute and Mount Vernon Hospital, and Mr. J. J. M. Shaw, F.R.C.S., was elected a member of the grand council.

MEDICAL NEWS

University of London

The following have been recognised as teachers of the university in respect of posts held in the schools indicated :—

Dr. J. H. Gray, anatomy, University College ; Dr. E. F. Scowen, medicine, and Dr. E. B. Strauss, mental diseases (psychiatry), St. Bartholomew's Hospital medical college ; Dr. R. G. Karn, anæsthetics, Royal Dental Hospital of London School of Dental Surgery ; and Dr. Mildred Creak, mental diseases (child psychiatry), Maudsley Hospital.

On April 26 and 28 Dr. A. Hrdlička, curator of the division of physical anthropology at the National Museum, Washington, will deliver two lectures. In his first lecture he will discuss the present status of our views on human evolution, and in his second the racial fallacies and realities of European peoples. On May 2 Prof. E. J. Bigwood, professor of biochemistry in the University of Brussels, will speak on chemical reactions between proteins and electrolytes. All these lectures will be given at 5 P.M. at University College, Gower Street, W.C.1.

University of Dublin

At recent examinations at the school of physic, Trinity College, the following candidates were successful :—

M.D.

Harry Nelson and D. M. Mitchell.

FINAL MEDICAL EXAMINATION FOR M.B., B.CH., B.A.O.

Therapeutics and Pathology.—Margaret L. Campbell, N. M. Smith, and William Houston (with second-class honours) ; W. F. Rogers, Marvin Polansky, L. T. Kelly, H. F. Kamp, J. M. Slattery, Yvonne O. Mallet, G. W. E. Little, J. I. Stafford, Harry Menter, I. T. Wolpe, Edna G. Merrick, E. P. Hill, C. D. MacCarthy, Olga Bloom, R. W. Carey, and Henry Hutchinson.

Medicine.—M. O'C. Drury (with first-class honours) ; R. S. W. Baker and Frank de Burgh Whyte (with second-class honours) ; E. G. Hobart, J. P. Gore-Grimes, E. N. O. Sodeinde, Patricia D. Concannon, M. E. Tapissier, C. J. Du Preez, F. P. O'Sullivan, Isidore Shreider, H. J. F. Draffin, Lily H. Bamber, Sheila Kenny, Edward Cullen, Boris Serebro, and D. St. B. F. Nunan.

Surgery.—M. O'C. Drury, M. E. Tapissier, E. R. F. Mellon, J. W. Cathcart, and F. R. T. Hollins (with second-class honours) ; L. S. Levinson, Simon Sevitt, G. S. Sheill, Mary A. Conyngham, R. A. Lutton, R. C. H. Cooke, L. I. Warnock, T. W. Hanna, D. G. Harrison, Frances M. C. Wolfe, Rosaleen de C. McCormick, E. R. Coetzee, Sylvia M. FitzGerald, Bridget P. Mansfield, E. N. O. Sodeinde, V. T. Williams, Noel McSharry, R. J. Sandys, William Sandford, L. A. S. Edmondson, C. J. Du Preez, Nathan Marks, Jack Freedman, C. H. Rutherford, and Boris Serebro.

Midwifery.—J. McD. Dougan, P. M. Goedvolk, and C. B. Robinson (with first-class honours) ; H. D. Chomse, A. H. Isaacson, F. L. Willington, Kathleen Dowling, David Selman, Frank de Burgh Whyte, Sylvia M. Hall, J. C. G. Moore, L. E. Morris, and J. D. Whiteside (with second-class honours) ; G. F. N. Anderson, Muriel Bannister, R. F. G. Lyons, Matthew Shreider, T. N. Arthur, W. E. Bamford, F. N. C. Levy, W. F. Carpenter, J. K. Craig, B. S. Good, D. W. McCarthy, J. R. Holmes, A. C. Corbett, Matthew Daly, Jack Freedman, Arthur Graham, G. O. Atkinson, N. C. Brown, Annie Dowds, Lucia M. E. FitzGerald, R. G. P. Heard, G. E. P. Kelly, C. W. Bradfield, N. J. Hogan, R. R. Hogg, Jack Morris, Samuel Tennenbaum, M. H. Waters, W. B. Dennehy, F. A. Hanna, J. H. Tyrrell, Olive S. H. Devlin, Maureen C. Johnston, R. C. H. Cooke, L. A. S. Edmondson, Bridget P. Mansfield, and Noel McSharry.

D.G.O.

P. C. Das and S. B. Ray.

D.P.H.

Part I.—J. C. Gaffney (with second-class honours) and J. G. Cunningham.

Hunterian Society

Prof. Emil de Grosz of Budapest will deliver the Hunterian lecture to this society at the Mansion House, London, E.C.4, on Monday, April 17, at 9 P.M. He will speak on the problem of glaucoma.

Royal Medical Benevolent Fund

The 103rd annual general meeting of this fund will be held at 11, Chandos Street, London, W.1, on Tuesday, April 25, at 5 P.M. Sir Thomas Barlow, F.R.S., the president, will be in the chair.

Institute of Psycho-Analysis

On April 18 Dr. Edward Glover will give the first of six public lectures on social psychology to be delivered at the house of the institute, 96, Gloucester Place, London, W.1, at 8.30 P.M. on Tuesdays. The other lecturers will include Dr. John Rickman, Dr. E. Bibring, and Dr. Ernest Jones.

University of Glasgow

On June 21 the university will confer the honorary degree of doctor of laws on Prof. G. Grey Turner.

Auxiliary Royal Army Medical Corps Funds

The annual meeting of this body will be held at 5.15 P.M. on Friday, April 28, at 11, Chandos Street, London, W.1.

St. Bartholomew's Hospital

A postgraduate course will be held at this hospital on June 15, 16, and 17. It will be open to all medical men and applications for admission should be sent to the dean of the school as soon as possible.

St. John Clinic, London

At the annual meeting of the clinic it was announced that a scheme for the rebuilding and enlargement of the clinic which would cost £12,000 was shortly to be put in hand. During last year 63,255 patients attended the clinic, of whom 15,371 were treated free. The other patients contributed £8735 in fees. In March, 1938, the Empire Rheumatism Council opened a research centre at the clinic. Inpatients are treated under the supervision of the medical staff of the clinic at a ward in St. Stephen's Hospital, L.C.C., which has been reserved for them.

Royal College of Obstetricians and Gynæcologists

A meeting of the council of the college was held on April 4 in Edinburgh, with Prof. W. Fletcher Shaw, the president, in the chair. The following were promoted to the fellowship and formally admitted by the president :—

George Stewart Davidson, Aberdeen ; Alison Mary Hunter, Glasgow ; Thomas Norman Arthur Jeffcoate, Liverpool ; Kenneth McMillan, Birmingham ; Ellen Douglas Morton, Glasgow ; William Charles Wallace Nixon, London ; Elaine Margaret Katharine Salmond, London ; *William Pelton Tew, Canada ; Beatrice Turner, London ; and Charles Henry Walsh, Liverpool.

The following were admitted to the membership :—

P. C. Barkla, S. G. Clayton, A. G. Cumming, J. C. Cuthbert, D. A. Davies, J. G. Gallagher, *J. E. Giesen, *R. E. Hirson, *F. D. Johnston, O. V. Jones, N. K. B. Kimbell, A. W. Lawler, A. W. Louw, *W. K. McIntyre, Mary H. Mayeur, G. P. Milne, *A. J. Murray, E. L. Nicolson, Sophie Schiller, James Smibert, J. K. Sutherland, Eileen M. Whapham, and Margaret M. White.

* In absentia.

J. L. Cameron was elected to the membership.

At the annual general meeting which followed Dr. William Gilliatt, Mrs. Hilda Lloyd, Dr. W. F. T. Haultain, and Prof. C. G. Lowry were elected to the council as representatives of the fellows, and Mr. A. C. H. Bell and Dr. John Sturrock as representatives of the members.

Committee on Holidays

Lord Amulree, who was chairman of the Government committee on holidays with pay which reported in 1938, is chairman of a new committee set up by the Industrial Welfare Society, with the approval of the Minister of Labour, to investigate the many holiday problems which are being created by the rapid increase in the number of workers receiving holidays with pay. The 1938 committee pointed out that difficulties might arise because accommodation and transport facilities were already hardly able to cope with the peak rush of holiday-makers to the seaside in the first fortnight in August, and also that many lower-paid workers would not be able to afford the type of holiday at present available. They therefore recommended that an effort should be initiated centrally to secure the spread-over of town or district holidays as far as practicable, and to encourage the setting up of new or the improvement of existing accommodation in order to provide more economical holiday facilities.

The new committee is fully representative of all the interests concerned, including the main-line railways, road transport, health resorts, hotel and apartment keepers, travel agencies, the National Savings Committee, employers' and workers' organisations, education committees and municipalities, and a number of voluntary social-service bodies. Although the committee is unofficial, the Minister of Labour has indicated that it will have the full coöperation of his department, and the Ministries of Labour,

Agriculture, Transport, Health, and the Board of Education are represented by observers on the committee. At its first meeting the committee set up five subcommittees, one of which will carry out a survey of existing accommodation, and the others will study the spread-over of holidays, the planning of future accommodation to meet the desires of holiday-makers, holiday savings schemes, and holiday publicity. Inquiries and information should be addressed to the secretary, Mr. N. Bamforth, Committee on Workers' Holidays, 14, Hobart Place, London, S.W.1.

Medical Diary

April 17 *to April* 23

SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY.—9.30 A.M. (1, Wimpole Street, W.1), Dr. T. Harrison Butler: The Anterior Capsule. Dr. W. J. B. Riddell: Multiple Factors in Hereditary Eye Disease. Dr. M. Klein: Wound Closure after Cataract Extraction. Dr. W. J. W. Ferguson: Bipolar Electrolysis in the Treatment of Detachment of the Retina. Dr. Arthur J. Bedell: The Fundus in the Diabetic. 2.30 P.M., Mr. F. A. Juler: Hypotony after Sclerocorneal Trephining. Prof. Hans Lauber: Pallor of the Disk. Dr. Harald Gjessing: On Holth's Iridencleisis Antiglaucomatosa. Mr. H. B. Stallard: coloured cinematograph film of ophthalmic operations. 5.15 P.M., Prof. H. J. M. Weve (Utrecht): Diathermy in Ophthalmic Practice (Bowman lecture).

FRIDAY.—9.30 A.M., Mr. C. B. Goulden, Mr. A. H. Levy, and Mr. R. Affleck Greeves: The Problems of Refraction. 2.30 P.M., Mr. J. P. F. Lloyd: Treatment of Increased Ocular Tension with Diathermy. Mr. J. Minton: The One-eyed Worker in Industry. Mr. G. T. W. Cashell and Mr. S. K. Kon: Lactose and Galatose Cataracts in Rats. Mr. E. Wolff: Blood-supply of the Optic Nerve and Retina. Mr. Lindsay Rea: Curved Retrobulbar Needle.

SATURDAY.—9.30 A.M., Mr. J. Adamson and Mr. E. F. Fincham: Effect of Lenses and Convergence Upon the State of Accommodation of the Eye. Dr. W. O. Gibson Taylor: Effect of Enucleation of One Eye on the Growth of the Face. Prof. Lauber: Combined Operations for Glaucoma. Dr. T. J. Phillips: Short-wave Diathermy in Ophthalmology. Mr. L. P. Jameson Evans: Tobacco Amblyopia.

HARVEIAN SOCIETY OF LONDON.

THURSDAY.—8.30 P.M. (26, Portland Place, W.1), Dr. D. Evan Bedford: The Pulse.

HUNTERIAN SOCIETY.

MONDAY.—9 P.M. (Mansion House, E.C.4), Prof. Emil de Grosz (Budapest): The Problem of Glaucoma (Hunterian lecture).

CHELSEA CLINICAL SOCIETY.

TUESDAY.—8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7), Mr. G. N. M. Tyrrell: The Scientific Aspect of Psychical Research.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

WEDNESDAY.—9 P.M. (Royal Northern Hospital, Holloway Road, N.7), medical clinical evening.

MEDICO-LEGAL SOCIETY.

THURSDAY.—8.30 P.M. (26, Portland Place, W.1), Sir Ambrose Woodall: The British Workmen's Compensation Acts.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1.

THURSDAY.—8 P.M., Dr. G. B. Bush: Seriescopy—Its Principles and Applications.
Medical Meeting.

FRIDAY.—11 A.M., visit to the radiological department of Charing Cross Hospital, W.C.2. 5.30 P.M., case demonstration and discussion at the institute.

SOCIETY OF CHEMICAL INDUSTRY.
Food Group.

SATURDAY.—10.30 P.M. (London School of Hygiene, Keppel Street, W.C.1.), Prof. P. Karrer (Zürich), Dr. A. Emmerie (Utrecht), and Mr. E. Lester Smith: The Chemistry of Vitamin E. 2.15 P.M., Mr. Karl E. Mason (Tennessee), Mr. S. W. F. Underhill, Mr. T. Moore, Miss A. M. Copping, Prof. V. Korenchevsky, M.D., Mr. B. P. Wiesner, Ph.D., and Mr. A. L. Bacharach: The Physiological Action of Vitamin E. Dr. Vogt-Möller (Copenhagen), Dr. E. Shute (University of Western Ontario), Mr. D. W. Currie, F.R.C.S., Dr. G. C. M. M'Gonigle, and Mr. C. R. Macdonald, F.R.C.S.E.: Clinical and Veterinary Uses of Wheat-germ Oil and Vitamin-E Preparations.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF GLASGOW.

TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church Street), Prof. A. J. Ballantyne: The Eye in Functional Nervous Disease.

TAVISTOCK CLINIC, Malet Place, W.C.1.

MONDAY.—6 P.M., Dr. Emanuel Miller: Neurotic Symptoms and Primitive Thoughts (1).

WEDNESDAY.—3 P.M., Dr. Cedric Shaw: Physical and Psychological Factors in Symptom Formation. 4.30 P.M., Dr. H. Crichton-Miller: Enuresis Nocturna.

FRIDAY.—6 P.M., Dr. E. A. Hamilton-Pearson: Minor Physical Disorders and their Psychological Effect.

INSTITUTE OF PSYCHO-ANALYSIS, 96, Gloucester Place, W.1.

TUESDAY.—8.30 P.M., Dr. Edward Glover: Freud's Contribution to Social Psychology.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

TUESDAY.—4.30 P.M., Dr. C. M. Hinds Howell: Syphilis of the Nervous System.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Prof. J. H. Dible: The General Pathology of Tuberculosis. 3 P.M., clinical and pathological conference (surgical).

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological conference. 3.30 P.M., Dr. J. B. Mennell: Backache in Gynæcology.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. H. A. T. Fairbank: Generalised Diseases of Bone.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

MONDAY to SUNDAY.—BROMPTON HOSPITAL, S.W.3, Tues., and Fri., 5.15 P.M., M.R.C.P. course in chest diseases.—MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1, Mon., Wed., and Fri., 5.15 P.M., primary F.R.C.S. physiology class.—BRITISH LEGION HEADQUARTERS, 25, Eccleston Square, S.W.1, Thurs., 8.30 P.M., lecture on surgery of the pleura.—ROYAL CANCER HOSPITAL, Fulham Road, S.W.3, Sat. and Sun. course on cancer.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1.

THURSDAY.—2 P.M., Sir Lancelot Barrington-Ward: Hirschsprung's Disease. 3 P.M., Dr. B. E. Schlesinger: The Pneumonias and Their Treatment.
Outpatient clinics daily at 10 A.M. and ward visits at 2 P.M.

MANCHESTER ROYAL INFIRMARY.

FRIDAY.—4.15 P.M., Dr. William Brockbank: medical cases.

Appointments

BAGSHAW, H. S., M.B. Manc., assistant medical officer of health for Oldham and resident medical officer at the Infectious Diseases Hospital.

BARRETT, J. C., V.C., M.B. Lond., F.R.C.S., hon. surgeon to the Leicester Royal Infirmary.

BONNIN, I. G., M.B. Melb., F.R.C.S., orthopædic registrar at St. John's Hospital, Lewisham.

CARTER, A. B., M.B. Camb., M.R.C.P., D.P.M., physician (grade II) at the Central Middlesex County Hospital, Willesden.

FERGUSON, JOHN, M.B. Glasg., D.P.H., medical officer of health for Bentley, Yorks.

JAMES, J. C. W., M.R.C.S., junior resident assistant medical officer at Bretby Hall Orthopædic Hospital, Burton-on-Trent.

LENNON, R. W., L.R.C.S.I., assistant medical officer at the West Riding Mental Hospital, Menston.

LOGAN, D. C., M.B. Edin., D.P.H., assistant resident medical officer at the South Middlesex Fever Hospital, Isleworth.

NINNIS, R. P., M.B. Durh., Capt. R.N. (retd.), temporary assistant medical officer for air-raid precautions work for Kensington.

OLIPHANT, F. C., M.B. Melb., resident medical registrar and pathologist at the Woolwich War Memorial Hospital, London.

PARK, W. D., M.B. Lond., supervisor of outpatient operations at the London Hospital.

PATERSON, J. M., M.B. Aberd., D.P.H., assistant medical officer for Walsall.

ROSS, A. I., M.B. Aberd., D.P.H., graduate assistant in department of pathology at the Radcliffe Infirmary, Oxford.

ROY, JANE B., M.B. St. And., assistant visiting obstetrician and gynæcologist to the Royal Infirmary, Dundee.

STARKIE, JOHN, M.B. Manc., D.P.H., assistant school medical officer for Oldham.

STEVENS, R. S., M.B. Camb., clinical assistant at the Royal Hospital, Sheffield.

SUTHERLAND, AGNES B., M.B. Edin., D.P.M., assistant medical officer of health for Cannock urban district.

TOWNROW, VINCENT, M.B. Lond., F.R.C.S., hon. consulting surgeon and director of the ear, nose, and throat department of the Chesterfield and North Derbyshire Royal Hospital.

WARREN, PATRICIA S., M.B. Edin., D.P.H., assistant medical officer of health for Oldbury.

London County Council.—The following appointments are announced. M.O. = medical officer; (T) = temporary; (PT) = part-time; (FT) = full-time.

LEE, T. J., M.B. Melb., M.R.C.P., visiting M.O. (T), Earlsfield House Children's Receiving Home;

SAUNDERS, R. J., M.R.C.S., visiting M.O. (T), Swaffield Road Institution;

EWEN, EVELYN B. G., M.B. Edin., D.P.H., assistant M.O., central medical staff;

SHORTT, C. J. DE VERE, M.D. Dubl., L.M., D.P.H., assistant M.O., central medical staff;

MOFFATT, P. McG., M.D. Lond., M.R.C.P., F.R.C.S., D.P.H., D.O.M.S., ophthalmologist (PT), central medical staff;

GISSANE, W. C., M.B. Sydney, F.R.C.S., surgeon specialist (FT), St. James' and Lewisham Hospitals;

MANSELL, H. E., B.M. Oxfd., F.R.C.P., cardiologist (FT), Lambeth and other hospitals;

HOWARTH, W. G., M.B. Camb., F.R.C.S., ear, nose, and throat specialist, Lambeth Hospital;

DAVIS, E. D. D., F.R.C.S., ear, nose, and throat specialist, St. Charles' Hospital;
TYRRELL, T. M., M.B. Camb., F.R.C.S., ophthalmologist, St. James' and St. John's Hospitals;
RINK, E. H., B.M. Oxfd, D.A., anæsthetist, St. Mary Abbots Hospital; and
KING, A. J., M.B. Lond., F.R.C.S., physician for congenital syphilis, St. John's Hospital.

*Hospital for Sick Children, Great Ormond Street, W.C.*1.—The following appointments have been made:—
NORMAN, A. P., M.B. Camb., house-physician;
UNWIN, P. C. S., M.B. N.Z., house-physician;
MCCORMACK, B. L., M.B. N.U.I., L.M., house-surgeon; and
WALTON, PETER, M.B. Edin., house-surgeon.

Colonial Medical Service.—The following appointments are announced:—
BELL, A. L. W., F.R.C.S.E., medical officer, West Africa;
CUMMING, R. A., M.B. Aberd., assistant pathologist, Malaya;
JAMIESON, J. M. M., M.B. Edin., medical officer, Northern Rhodesia;
MEREDITH, J. S., M.B. Glasg., medical officer, Northern Rhodesia;
WELSH, BARBARA C., M.B. Edin., D.P.H., medical officer, Malaya;
HOWAT, C. H., M.B. Edin., F.R.C.S.E., D.T.M. & H., civil surgeon, Aden;
MACLEOD, N. C., M.B. Glasg., D.P.H., deputy director of health services, Hong Kong;
MURPHY, P. P., M.B. Dubl., D.T.M. & H., medical officer, Aden; and
SEMPLE, J. M., M.B. Dubl., assistant director of medical services, Uganda.

Examining Surgeons under the Factories Act, 1937: Dr. W. W. MILLEN (New Southgate District, Middlesex); Dr. R. C. SCOTT (Burton-on-Trent District, Stafford); Dr. F. W. CLARK (Maryport District, Cumberland); Dr. E. B. HARVEY (Burgess Hill District, Sussex); Dr. A. MACDONALD (Redruth District, Cornwall); Dr. J. P. SENIOR (Addingham District, York, W.R.); Dr. A. E. STAFFURTH (Ramsey District, Huntingdon); Dr. R. BENNETT (Wilmslow District, Chester); Dr. E. A. WELSH (Felton District, Northumberland); Dr. J. R. ANDERSON (Fortrose District, Ross); Dr. W. F. GIBB (Crawley District, Sussex); Dr. A. H. HALL (Bankfoot District, Perth); Dr. G. HARVEY (Dumbarton District, Dumbarton). Dr. P. M. J. BOBBETT (West Drayton District, Middlesex); Dr. G. H. G. HOPE (Coupar Angus District, Perth); and Dr. G. N. MACKENZIE (New Abbey District, Dumfries).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Infirmary.—Registrar to X-ray and radium dept., £300.
Bedford County Hosp.—Cas. O., at rate of £150.
Birkenhead, Clatterbridge Isolation Hosp.—Res. asst. M.O., £200.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Brighton County Borough.—Male sen. M.O. and asst. to M.O.H., £750.
Bristol Eye Hosp.—Sen. res. H.S., a rate of £150.
Buckinghamshire County Council.—Deputy county M.O.H. and school M.O., £750.
Cambridge, Addenbrooke's Hosp.—Res. surg. O., £225.
Cheshire Education Committee.—Asst. school M.O., £500.
Coventry and Warwickshire Hosp.—Visiting fracture and orthopædic surgeon, £600. Also three H.S.'s to special depts., each at rate of £150.
Dewsbury and District General Infirmary.—Visiting anæsthetist.
*Dreadnought Hosp., Greenwich, S.E.*10.—H.P., at rate of £110.
Durham County and Sunderland Eye Infirmary.—H.S., £350.
Essex County Council.—Temp. tuber. officer, £12 a week.
Exeter, Princess Elizabeth Orthopædic Hosp.—Res. H.S., at rate of £150.
Exeter, Wonford House Registered Hosp.—Asst. M.O., £350.
Hastings, Royal East Sussex Hosp.—Sen. H.S., at rate of £200.
Hertford County Hosp.—Hon. asst. surgeon.
*Hosp. for Sick Children, Great Ormond Street, W.C.*1.—Out-patient med. reg., £150.
Hove General Hosp.—Jun. res. M.O., at rate of £120.
Ilford, King George Hosp.—H.S., at rate of £100.
Ipswich, East Suffolk and Ipswich Hosp.—Res. surg. O., £400 single man, £550 married man.
Kent County.—Two asst. county M.O.H.'s, each £700.
*Lambeth Metropolitan Borough, S.W.*2.—Deputy M.O.H., £840.
Lancaster Royal Infirmary.—Hon. surgeon. Hon. physician. Also additional asst. hon. physician.
Lanchester Joint Hosp. Board.—Med. supt. for infectious hosps., £750.
Leicester, City Isolation Hosp. and Sanatorium, Groby Road.—Res. M.O., at rate of £300.
*London Hosp., E.*1.—Surgical and medical outpatient first assts., each £150. Hon. asst. anæsthetist. Also hon. asst. physician to dept. of physical medicine.
London Lock Hosp., 283, *Harrow Road, W.*9.—Res. M.O. to all depts., at rate of £175.
London University.—University chair of obstetrics and gynæcology, £2000.
Maidstone, Kent County Mental Hosp.—First asst. M.O., £475.
Manchester, Withington Hosp.—Res. asst. M.O., £250.
Manchester Ear Hosp., Grosvenor Square, All Saints'.—Visiting anæsthetist.
Manchester Royal Children's Hosp., Pendlebury.—Asst. surgeon, £50.
Manchester Royal Infirmary.—Res. cas. O., £150. Also res. jun. M.O. for Barnes Convalescent Hosp., at rate of £150.
Middlesbrough, Holgate Municipal Hosp.—Asst. res. M.O., £270.
Middlesex County Council.—Jun. res. asst. M.O.'s, each £250.
Norwich, Norfolk and Norwich Hosp.—H.S. to spec. depts., £160. Also cas. O., £120.
Nottingham City Hosp.—Res. asst. surg. O., at rate of £250.
Nottingham General Hosp.—H.P., at rate of £150.
Nottingham and Midland Eye Infirmary.—Res. H.S., £200.
*Paddington Green Children's Hosp., W.*2.—Hon. radiologist.
Plymouth City Isolation Hosp.—Asst. res. M.O., £300.
Pontefract General Hosp., &c.—Jun. res. M.O., at rate of £150.
Preston and County of Lancaster Royal Infirmary.—H.S., £150.
*Prince of Wales's General Hosp., N.*15.—Hon. officer to speech therapy and lip-reading dept. Also hon. dental surgeon.
*Princess Beatrice Hosp., Earl's Court, S.W.*5.—Hon. asst. surgeon to ophth. dept.
*Princess Elizabeth of York Hosp. for Children, Shadwell, E.*1.—Hon. neurological surgeon.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Rochester, St. Bartholomew's Hosp.—Cas. O., at rate of £150.
Rotherham Hosp.—H.P., £180.
Rotherham Voluntary General Hosp.—Secretary-superintendent.
***Royal Air Force.*—Commissions.**
*Royal Cancer Hosp., Fulham Road, S.W.*3.—Sen. asst. radiologist for therapeutic section of radiological dept., £450. Also radiologist, £400.
*Royal College of Surgeons, Lincoln's Inn Fields, W.C.*2.—Mackenzie Mackinnon research fellowship, £300.
***Royal Naval Medical Service.*—M.O.'s.**
*Royal Waterloo Hosp. for Children and Women, Waterloo Road, S.E.*1.—Res. M.O., at rate of £150. Also H.P. and H.S., each at rate of £100.
Runwell Hosp. for Nervous and Mental Disorders, near Wickford, Essex.—H.P., at rate of £150.
***St. Mary's Hosp., W.*2.—Cas. H.S., at rate of £100.**
*Samaritan Free Hosp. for Women, Marylebone Road, N.W.*1.—H.S., at rate of £100.
Sheffield Children's Hosp.—H.S., at rate of £100.
Shoreditch Metropolitan Borough.—Asst. M.O.H., £650.
Slough Borough, &c.—Deputy M.O.H. and deputy M.O. of hosp., £500.
Stafford, Staffordshire General Hosp.—H.S. and H.P., at rate of £175 and £150 respectively.
***Stoke-on-Trent, North Staffordshire Royal Infirmary.*—H.S. to orthopædic dept., at rate of £150.**
Sunderland Royal Infirmary.—H.P., at rate of £120.
Warrington Infirmary and Dispensary, &c.—Visiting pathologist and bacteriologist, £500.
Wembley Borough.—Asst. M.O.H., £500.
*Westminster Hosp., Broad Sanctuary, S.W.*1.—Additional offices, from £100 to £350.
West Sussex County Council.—Asst. county M.O.H. and district M.O.H., £800.
Woking and District Victoria Hosp.—Res. M.O., at rate of £130.
Wolverhampton Royal Hosp.—H.S. to fracture and orthopædic dept., at rate of £100.
***Woolwich and District War Memorial Hosp., Shooters Hill, S.E.*18. H.P., at rate of £100.**

The Chief Inspector of Factories announces a vacancy for an Examining Factory Surgeon at Golspie (Sutherland). (Latest date for receipt of applications, April 18.)

Births, Marriages and Deaths

BIRTHS

JAUCH.—On April 10, at Grantham, the wife of Mr. F. Joselin Jauch, F.R.C.S.—a daughter.
MACDONALD.—On April 9, at Nuneaton, the wife of Dr. George A. Macdonald—a daughter.
ROLFE.—On April 2, at Cardiff, the wife of Dr. Arnold Rolfe, of Llangennech—a son.
SAYLE.—On April 7, at Nuffield House, Guy's Hospital, the wife of Dr. Eric Sayle—a daughter.

DEATHS

BARRETT.—On April 7, at Pilgrims Hatch, near Brentwood, Ashley William Barrett, M.B. Lond., M.R.C.S., L.D.S., aged 90.
COLLYNS.—On April 6, at Dulverton, Robert John Collyns, M.R.C.S.
EHRHARDT.—On April 3, Julius Martin Ehrhardt, L.R.C.P.I., of Battersea, aged 78.
ELRINGTON.—On April 4, at St. Mary's Vicarage, Willesden, Nicholas Elrington, M.R.C.S.
EWART.—On April 10, at Dundee, Robert William Thomas Ewart, M.B. Edin., of Sailfoot, Dumfriesshire, and Montrose.
HERDMAN NEWTON.—On April 10, in Edinburgh, Robert Henry Herdman Newton, M.D. Edin., F.R.C.P.E.
KIRKBY.—On April 9, Robert Casement Kirkby, M.R.C.S., of Walberton, Sussex, aged 70.
MACKINTOSH.—On April 10, in London, John Stewart Mackintosh, M.D. Durh., M.R.C.S., of Sandgate, Kent, aged 68.
MCQUEEN.—On April 4, at Brompton Hospital, Robert Martin McQueen, M.R.C.S., of Queen Square, W.C.
MATURIN.—On April 4, at Lymington, Hants, Francis Henry Maturin, M.B. Camb., late lieut.-colonel (T.D.), 2/7th Hampshire Regt., and R.A.M.C., aged 67.
NAPIER.—On April 8, at Penzance, James Wilson Napier, M.B. St. And., late of Gravesend, aged 38.
PAINE.—On April 7, Henry Paine, M.D., of Broadstone, Dorset, aged 73.
WATSON.—On April 8, at Havre des Pas, Jersey, C.I., John Watson, M.D. Durh., F.R.C.S.E., D.P.H., aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

TREASURE TROVE

THE *Law Journal* lately drew attention to the terms of the verdict of a coroner's jury in a case of treasure trove in Surrey. A Sutton florist found in his garden a hoard of 61 silver and bronze coins. There were 30 silver coins, some of the Elizabethan period and one believed to be over a thousand years old. Bronze or copper coins are regarded as outside the scope of an inquest. With regard to the silver coins of the Sutton hoard the jury found a verdict that they were treasure trove and that they should be forwarded to the authorities of the British Museum to arrange for the purchase or sale of any of them. This method of disposal is doubtless what will follow.

A circular letter on the subject, sent to chief constables in 1925 by the Home Office, is printed in the 1927 edition of Jervis. It conveyed the Treasury decision that in future the coins, ornaments or other objects constituting treasure trove would, as a general rule, be returned to finders who fully and promptly reported their discoveries and handed over the treasure to the proper authorities; the only deduction would be an amount of 20 per cent. calculated on the antiquarian value. This letter of 1925 was superseded in 1931 by a fresh circular issued by the British Museum with the sanction of the Treasury. The new arrangement allowed finders the full market value (without deduction) of any treasure trove retained for the Crown or for a museum. This being the modern practice, the jury in the Sutton case was probably informed of it and may have considered it a suitable method of disposal. The point made by the *Law Journal* is that the disposal of the silver coins to (or through) the British Museum was no concern of the jury. The coroner's jurisdiction, says our learned contemporary, is limited to inquiring whether the discovered objects are treasure trove—that is to say, are articles hidden away in the earth by some person with the intention to retrieve them—and, if they are, then to declare who were the finders. This legal view is based on the judgment of Mr. Justice Stirling in Attorney General *v.* Moore (1893) where some silver pyxes and other objects had been found on a Herefordshire farm, and the coroner was not content to inquire into the limited issue but prosecuted his inquiries further into the merits of a claim of title by the lord of the manor.

While the views of the *Law Journal* must receive the utmost respect, one may be permitted to add that the point is not entirely free from doubt. Jervis points out that the question was not argued on behalf of the coroner in the case before Stirling, J.; that Mr. Justice Day had expressed a divergent opinion previously; and that it was customary, both before and after the passing of the 1887 Act, to find the title of treasure-trove articles to be in the Crown or in someone else. If the result of the inquiry indicates that the find is treasure trove, the treasure vests in the Crown because the Crown has a prerogative right to all treasure trove; if there is any question of title, the question is for the law-courts and not for the coroner's jury. The 1887 Act (section 36) says that a coroner "shall continue as heretofore to have jurisdiction to *inquire of treasure that is found, who were the finders and who suspected thereof.*" Jervis suggests that the words italicised above do not limit the jurisdiction quite as narrowly as the Stirling judgment appears to prescribe. The departmental committee on coroners, over which Lord Wright presided in 1936, was too much occupied with problems of publicity, riders of responsibility, animadversions by coroners and the importance of the rules of evidence, to have anything useful to add on the subject of treasure trove.

To return to the topic of the bronze coins, Sir George Hill's admirable book on "Treasure Trove in Law and Practice" voices the antiquary's regret that treasure trove, in the words of Sir Edward Coke, must consist of "any gold or silver, in coin, plate or bullion." When the law took shape, either there was no existing coinage other than gold or silver, or else the coinage in baser metals was of negligible value. Nowadays the value of a hoard depends less on the nature of the metal than on the antiquarian importance. English antiquaries envy the wider terms of the Scottish law where all objects of antiquity (and not merely gold and silver objects) come within the scope of treasure trove. Even a fallen meteorite is said to have been claimed in Scotland. The English law is not likely now to be extended. The circular letter of 1931 (printed in Sir George Hill's book) remarks hopefully, nevertheless, that, though coins and other ancient objects of copper or bronze are not treasure trove and need not be reported to the coroner, the British Museum authorities are glad to hear of such finds and will in suitable cases arrange for their purchase or sale.

IN COMMEMORATION OF BOERHAAVE

THE commemoration of the 200th anniversary of the death of Boerhaave was the occasion of the delivery of a number of addresses by doctors of various nationalities in September, 1938. These have now been collected in a small volume,[1] which is adorned with a number of excellent photographs. The place of honour is given to an address by Dr. Schoute, which has already been published separately.[2] Dr. Schoute defends his great compatriot against certain denigrations which are associated, perhaps with little reason, with the name of Daremberg. Other tributes are printed here over such well-known names as Wenckebach, Castiglione, and Sigerist. Nor must we omit the praises of Boerhaave as a botanist, and as a chemist. There was in fact no department of knowledge in which he did not gain the esteem of his fellow-workers: not by any outstanding contribution but by the coördinating influence of his encyclopædic learning and the aid and encouragement which he gave to all work in the scientific field. In addition to professorial burdens which amaze us, as they astonished his contemporaries, he had probably the widest cosmopolitan practice of any age, being consulted by letter from every country in the world. The Leyden commemoration, worthily represented by this volume, has increased Boerhaave's reputation as a leader in the reform of medicine.

INSULIN IN SCHIZOPHRENIA

Sakel's method of inducing hypoglycæmia was used by A. Vivado in 92 cases of schizophrenia in the National Asylum of Chile (*Rev. Psiquiat.* July, 1938, p. 1). His series is tabulated as regards condition, treatment, and results, and analysed in further tables according to the length of illness before treatment with insulin. From these it appears that of 27 patients with a history of six months or less 7 completely recovered and 7 made a social recovery; of 43 with a history of six months to a year 26 recovered; of 13 with a history of a year to eighteen months 4 recovered; and of 35 with a history of more than eighteen months 10 recovered. Most of this last group had been ill for less than four years, but 1 of them recovered who had had schizophrenia for twenty years. The low rate of recoveries in the series with a history of six months or less is attributed by Vivado to the fact that recent cases of schizophrenia had to be severe before he accepted the diagnosis. There were 2 deaths in patients under treatment and 4 relapses after apparent recovery.

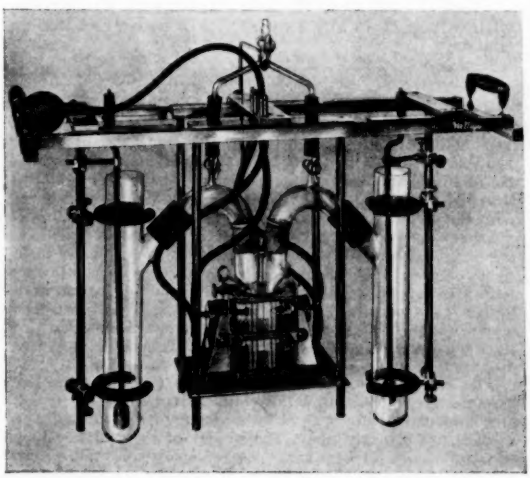
1. Memorialia Herman Boerhaave. Haarlem: De Erven F. Bohn. 1939. Pp. 132. Hfl.1.90.
2. See *Lancet*, Jan. 7, 1939, p. 39.

ELECTROPHORESIS APPARATUS

A RAPIDLY increasing interest is being taken in "biocolloids" (biologically active substances of large molecular size), especially proteins and protein-like compounds. Some viruses, enzymes, hormones, and the constituents of blood-serum responsible for immunity are very likely proteins. Substances of this kind mostly offer difficulties in purification and identification on account of their instability and other properties which prevent the biochemist from applying to them the common chemical methods. Instead, several physical methods have proved extremely valuable as an aid to research in this field—e.g., ultracentrifugation, ultrafiltration, adsorption, chromatographic analysis, and electrophoresis. The last method utilises the migration of the substance through a column of buffer solution under the influence of an electric field. As first shown by Sir William Hardy, this property is a useful quantitative characteristic of the biocolloids. The same principle allows a very effective and quite gentle separation of substances that migrate in different ways, and therefore is applicable to very unstable systems. Certain technical difficulties, however, have hitherto prevented a more widespread use of this valuable method. These difficulties have now been largely overcome by Prof. A. Tiselius of Uppsala (*Trans. Faraday Soc.* 1937, **33**, 524).

The Tiselius apparatus is now manufactured by Messrs. Hellige and Co., of Freiburg i. Breisgau, in coöperation with the inventor. In this type of apparatus a much higher voltage can be used, the various components of a mixture can be completely separated, and a special optical arrangement enables direct visual observation of the process of separation,

FIG. 1



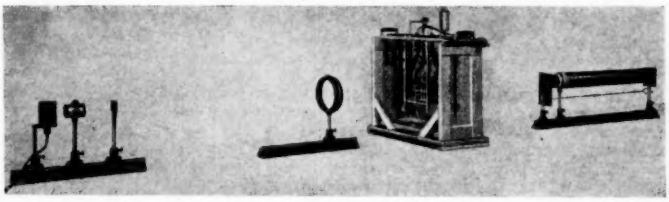
the various components appearing as bands in a spectrum. The usual outfit consists principally of three different parts:

(1) Fig. 1 shows the actual electrophoresis equipment with ground, parallel glass troughs, arranged in the shape of a U. The two middle troughs can be displaced by means of a pneumatic device. The electrodes and electrode vessels are seen to right and left with their connecting tubes and the fixing and suspension devices.

(2) Fig. 2 shows the photographic arrangement with illuminating lamp, condenser, Schlieren objective, slit for illumination, Schlieren diaphragm, and camera.

(3) Thirdly there is the refrigeration device for keeping constant the temperature of the solutions under test, with brine container, in which the electrophoresis apparatus must be placed. (For observation of the proceedings in the U-tubes the container is provided with windows through which the rays of the optical device can pass.)

FIG. 2



A cooling unit is provided and means of regulating the temperature.

Moreover, the following additional devices are required: a system for current supply and a device for compensation of the migration in the U-tubes and for easy separation of the components.

The method is already in use in chemical and medical laboratories in England, U.S.A., Germany, and Scandinavia. Among notable uses of medical interest are the fractionation of normal and immune sera (Tiselius, *Biochem. J.* 1937, **31**, 1464, and Tiselius and Kabat, E. A., *Science*, 1938, **87**, 416) and the purification of tuberculin (Seibert, F. B., Pedersen, K. O., and Tiselius, *J. exp. Med.* 1938, **68**, 413).

CLEFT PALATE AND HARE-LIP IN SCANDINAVIA

THE repair of cleft palate and hare-lip is now being tackled systematically in Scandinavia. Not so long ago these patients either remained at home, without the benefits of surgery, dentistry and special phonetic training, or were indiscriminately distributed throughout the surgical services of the land and operated on by men without special training and experience. Centralisation of this material has for several years been attempted in Denmark where at the present time a deadlock has arisen over principles and personalities. To the onlooker it may seem strange that a theologian without any medical degree should be preferred to a surgeon as the chief of a cleft-palate service. In Finland the position is more satisfactory, for the Finnish Red Cross has been recently endowed with funds specially earmarked by a generous donor and is proceeding to spend them on the basis that centralisation and a high degree of technical skill are essential features of any scheme of organisation. The steps to be taken include a census of cases, the training of a woman teacher in phonetic treatment, and the subsidy of a doctor willing to specialise in this work. Dr. A. Soivio, already an experienced operator, has been financed by the Finnish Red Cross during his studies abroad. It is estimated that in Finland alone, with a population of only 3,670,000, at least 70 babies are born every year with this deformity, and that in spite of the high mortality early in life there are between 2500 and 3000 of these people alive. In Sweden there is also a movement towards centralisation of treatment. Dr. Edberg of Gothenburg has collected records of 490 cases.[1] Of these 58 per cent. are males, and 67 per cent. are left-sided. The severe forms are the most common. His own observations confirm those made elsewhere that the incidence of the deformity is about 1 per 1000 births.

1. Edberg, E., *Nord. Med.* Jan. 14, 1939, p. 89.

He has found evidence of direct inheritance in 17 per cent. of his cases and has noted that often the deformity is associated with others, such as congenital dislocation of the hip and syndactylia. Only 2 of his patients were definitely imbecile, but many were scholastically backward, partly on account of defects of speech and hearing. His advocacy of operative treatment is tempered by the observation that double cleft palates with a very defective roof to the mouth benefit more from a well-fitting plate which provides a satisfactory bite than from operation. Aided by a dentist and a doctor trained in phonetics, he has alleviated much suffering, but confesses that even the most successful operations fail to achieve perfect results.

MUSTARD GAS

THE action of dichlorodiethyl sulphide or mustard gas on the skin and other tissues seems to be much more severe than would be expected if the conventional explanation of its toxicity is correct According to this it is hydrolysed on absorption into thiodiglycol and hydrochloric acid and its toxic action is due to the hydrochloric acid :

$$(C_2H_4Cl)_2S + 2H_2O = (C_2H_4OH)_2S + 2HCl$$

The buffering action of the blood and the slowness of the decomposition of the "gas" even at blood-heat seem to rule out this explanation, and in any case it seems impossible that a local concentration of hydrochloric acid could be attained high enough to cause blistering. I. Berenblum and A. Wormall (*Biochem. J.* 1939, **33**, 74) have investigated the suggestion that the vesicant action of mustard gas is due to its reaction with constituents of the living cell. They point out that the introduction of new groups into the protein molecule by attachment to the free amino-groups leads to changes in the immunological properties of the protein, and have therefore studied the immunological properties of proteins treated with mustard gas. This work, which included experiments in which dichlorodiethyl sulphone took the place of mustard gas, shows that these compounds render protein "foreign" to its animal of origin, and this may account for the damage done by a small dose of mustard gas, its delayed action, and the fact that people who have been badly gassed are liable to become hypersensitive to it.

FINGERPRINTS

Sheriff Wilton has set out the historical romance of fingerprints, and has at the same time revived a controversy that were better forgotten.[1] He pleads for recognition of Faulds as the first to conceive the medicolegal significance of fingerprints, in a communication to *Nature* in 1880—"bloody finger marks or impressions on clay, glass, etc., may lead to the scientific identification of criminals." Herschel, of the Indian Civil Service, had, for more than 20 years before this date, adopted the plan of making natives who signed documents leave their fingerprints upon them, to prevent any subsequent repudiation of the signature : he had recognised the individuality of such prints but had not published any account on the subject. If the printed word is regarded as evidence of priority there can be no argument on the matter; Herschel himself, in a letter to *Nature* in 1917, admits Faulds's claim to have realised the forensic importance of the system. For the rest the book summarises the recorded cases from 1880 on in which fingerprint evidence has played an important part, and deals shortly with their admissibility as evidence. Incidentally, Wilton reveals that although conviction solely on fingerprint evidence was first obtained in England in 1909 and even in Australia in 1912, it was not until 1933 that a court of law in Scotland at last admitted their infallibility. As a historical survey the book is attractive and complete, showing evidence of most painstaking research : the bibliography must contain reference to every article which was ever written on fingerprints.

1. Fingerprints : History, Law and Romance. By G. W. Wilton B.L., one of H.M. Counsel in Scotland and of the Middle Temple, barrister-at-law. London : William Hodge and Co. 1938. Pp. 317. 12*s.* 6*d.*

LOTHEISEN'S OPERATION

Mr. HAMILTON BAILEY and Mr. R. J. MCNEILL LOVE write : In his instructive paper on femoral hernioplasty, published in your last issue, Mr. E. M. Cowell states that Rose and Carless, as well as Bailey and Love, mis-spell "Lotheissen's" operation. Mr. Cowell refers to earlier editions of our book. In the present edition not only did we go to considerable trouble to verify the spelling but in addition added the following historical footnote on the appropriate page : "Georg Lotheisen, contemporary. Surgeon, Kaiser Franz Josef Hospital, Vienna."

THE name of the maker of the Salisbury colostomy appliances described by Dr. J. I. F. Knight in our issue of April 8 (p. 827) has been changed to the Edwards' Surgical Company. The address is as given, 189, Regent Street, London, W.1.

THE fourth of a series of handbooks issued by CIBA LTD. (40, Southwark Street, London, S.E.1.) is devoted to The Sex Hormones, and surveys their chemical constitution, biological properties, and clinical applications, supplying also a classified scheme of dosage.

J. FLINT, SANDOZ PRODUCTS have produced a brochure (Modern Therapy, No. 10) entitled Some Aspects of the Pain Problem. It discusses pain arising from cardiovascular, nervous, visceral, muscular, and other disorders—with special reference to the Sandoz preparations of belladonna alkaloids and other antispasmodic and analgesic drugs.

A catalogue reaching us from the LONDON SPLINT CO. (18, Westmoreland Street, W.1) illustrates a large number of appliances employed in the treatment of fractures, and explains how many of them are used. Most of those shown are fashioned of perforated aluminium, and they are made, it is stated, by the world's largest manufacturer of fracture equipment, with a factory in the United States as well as in this country.

TRAVELLING FELLOWSHIPS IN MEDICINE.—The Medical Research Council invite applications for six Rockefeller medical fellowships for the academic year 1939–40, which will be provided from a fund with which the council have been entrusted by the Rockefeller Foundation of New York. They are intended for British graduates who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad, before taking up positions for higher teaching or research in the United Kingdom. The stipend will ordinarily be at the rate of £360 per annum for a single fellow, and of £480 per annum for a married fellow. Travelling expenses and some other allowances will be paid in addition.

The council also invite applications for four Dorothy Temple Cross research fellowships in tuberculosis, which are awarded from a special endowment of which the council are the trustees. The object of these fellowships is to give special opportunities for study or research to suitably qualified British men or women "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." The stipend will ordinarily be at the rate of £350 per annum for a single fellow, and of £480 per annum for a married fellow, with an allowance for travelling and incidental expenses.

Applications for any of these fellowships must be lodged with the council not later than May 8. Further particulars and forms of application are obtainable from the secretary of the council, 38, Old Queen Street, London, S.W.1.